AN ECOLOGICAL STUDY OF THE SUSQUEHANNA RIVER IN THE VICINITY OF THE THREE MILE ISLAND NUCLEAR STATION

Annual Report For 1976

by

George A. Nardacci, Project Leader, and Associates
Ichthyological Associates, Inc.
P.O. Box 223, Etters, Pennsylvania 17319

for

METROPOLITAN EDISON COMPANY

POOR ORIGINAL

ICHTHYOLOGICAL ASSOCIATES, INC.
Edward C. Raney, Ph.D., Director
301 Forest Drive, Ithaca, New York 14850

February 1977

1565 038

7911010 754

AN ECOLOGICAL STUDY OF THE SUSQUEHANNA RIVER

IN THE VICINITY OF THE THREE MILE ISLAND NUCLEAR STATION

Annual Report For 1976

by

George A. Nardacci, Project Leader, and Associates

Ichthyological Associates, Inc.
P. O. Box 223, Etters, Pennsylvania 17319

POOR ORIGINAL

for

METROPOLITAN EDISON COMPANY

ICHTHYOLOGICAL ASSOCIATES, INC.
Edward C. Raney, Ph.D., President
301 Forest Drive, Ithaca, New York 14850

February 1977

1565 039

TABLE OF CONTENTS

POOR ORIGINAL

1565 040

POOR ORIGINAL

TABLES

1565 041

POOR ORIGINAL

1565 042

FIGURE

1565 043

POOR ORIGINAL

TABLES

POOR ORIGINAL

1565 044

FIGURES

SECTION 4.0 AMBIENT WATER QUALITY

POOR ORIGINAL

TABLES

1565 045

SECTION 5.0 THERMAL PLUME MAPPING

POOR ORIGINAL

TABLES

1565 046

POOR ORIGINAL

1565 047

POOR ORIGINAL

1565 048

POOR ORIGINAL

ACKNOWLEDGMENTS

We wish to thank Barbara Beck, Michael Buring, Thomas Jenckes, Bud Koch, James Nudge, John Romanski, and James Stacey of Metropolitan Edison Company for their assistance in the past year. We also appreciate the help of Three Mile Island Nuclear Station Security without whose assistance our work would have been impossible.

The following biologists participated in the study in 1976: John Epler, Robert Eppley, Richard Evans, Harold Hagerty, Barbara Lathrop, Robert Malick, Eric McClellan, James Montgomery, George Nardacci, Janet Polk, Wayne Potter, Philip Ritson, James Smith, Walter Soya, Linda Wike, and Lynn Wike.

Linda Wike provided secretarial services and assistance.

We would also like to acknowledge the following specialists for their advice and assistance in confirming the performing determinations: Dr. Marvin L. Bobb (Hemiptera), Mr. Jarl K. Hiltunen (Tubificidae), Mr. Michael S. Loden (Naididae), Mr. Thomas P. Poe (Hirudinea), Dr. John W. Reynolds (Megadriles), Dr. Selwyn S. Roback (Chironomidae), Dr. Ole A. Saether (Chironomidae), Mr. Clark N. Shiffer (Odonata). Others who assisted in providing help include: Dr. Robert Denoncourt, the Pennsylvania Fish Commission and a special thanks to Dr. Guy L. Steucek (Millersville State College) and Jeffery J. Hondo (Ichthyological Associates, Inc., Absecon, N.J.) for their statistical advice.

1565 049

1.0 INTRODUCTION

This document is the third annual postoperational report on the ecology of York Haven Pond (Lake Frederic), Susquehanna River, Pennsylvania in the vicinity of the Three Mile Island Nuclear Station (TMINS). Ichthyological Associates, Inc. initiated the study in February 1974. This report covers the period from January through December 1976. Sections are presented to meet the Environmental Technical Specifications (ETS) for TMINS, Unit 1, Appendix B. Parameters analyzed are the same as reported in Potter and Associates (1976) with the exception of impingement of fishes, entrainment of ichthyoplankton, entrainment of plankton (phytoplankton and zooplankton), and bird impaction on cooling towers. The ETS requirements for surveillance of these parameters were fulfilled and the programs were terminated.

The TMINS Unit 1 achieved criticality on 5 June 1974. Unit 1 has been at various levels of operation ranging from complete shutdown to 100%, 830 megawatts. In 1976, the TMINS Unit 1 was shutdown for refueling from 21 February to 27 May.

Potter, W.A. and Associates. 1976. An ecological study of the Susquenanna River in the vicinity of the Three Mile Island Nuclear Station. Annual Report for 1975. Ichthyological Associates, Inc. 395 pp.

POOR ORIGINAL

1565 050

POOR ORIGINAL

1.1 SUMMARY

1.1.1 Fish

Fishes were sampled at four trammet and five seine stations, March through October 1976.

A total of 144 trammet collections yielded 822 fish of 25 species. The pumpkinseed and channel catfish were most abundant. Common fishes were taken in equal or greater numbers downstream from the Discharge than upstream. No significant change in species rank at individual stations was observed from 1974 through 1976.

A total of 90 seine collections yielded 10,478 fish of 35 species. The spottail shiner ranked first in overall abundance and was the most common species at all stations. Most common species showed nearly equal distribution among upstream and downstream stations. Significant differences in species rank at one upstream and one downstream station were observed between 1975 and 1976.

No appreciable differences were noted in condition factor or weights downstream and upstream from the Discharge where sufficient numbers were present; most values were within the ranges observed in previous years.

The fish leech, Myzobdella lugubris, and anchor worm (Lernaea spp.) were common ectoparasites.

Variations in fish abundance may be attributable to year class fluctuations. The impact of TMINS Unit 1 on fishes was negligible.

1565 051

POOR ORIGINAL

1.1.2 Macroinvertebrates

Macroinvertebrate collections were taken semimonthly April through October 1976. A total of 90,567 specimens representing 112 taxa was taken. Limnodrilus hoffmeisteri, Chironomus decorus, and Nais elinguis were the most abundant taxa. Limnodrilus hoffmeisteri was usually most abundant at all stations each month. Goniobasis virginica, L. hoffmeisteri, and C. decorus had the greatest biomass of all specimens weighed.

Monthly estimates of diversity ranged from 0.66 to 2.76. Index of percent similarity values between stations were in the intermediate to high affinity range (>50% similarity). High similarities in species composition were found between Station 1A2 and 9B1 (91%), and 11A1 and 11A2 (89%).

Comparison of number of taxa between macroinvertebrate stations and sample dates for 1976 was accomplished by analysis of variance, randomized block design. The Student-Newman-Keuls multirange test revealed that Stations 1A2 and 9B1 and 11A1, 11A2, and 9B1 were similar in number of taxa.

Three-factor analysis of variance performed on densities of Limnodrilus hoffmeisteri May through October 1974 through 1976 revealed that years, sample dates, and stations were significantly different.

The macroinvertebrate communities appeared to be more affected by ice and high river flow than by the operation of TMINS.

1565 052

POOR ORIGINAL

1.1.3 Ambient Water Quality

.1.3.1 Physicochemical Parameters

Except for dissolved oxygen and total suspended solids the monthly istribution of parameters was similar. Mean values were high in September . nd low in April and May. The monthly mean concentrations of most parameters . : Station 11A1 (TMINS Discharge) were generally higher than at the other : tations.

.1.3.2 Fecal Coliform

The highest overall mean density of fecal coliform was at Station 1A1; :he lowest was at Station 11A1 (TMINS Discharge). Monthly mean fecal :oliform densities were lowest in April, increased throughout the summer, and peaked in September. For all stations the geometric mean of fecal coliform densities exceeded the limit established for the Commonwealth of Pennsylvania.

1.1.4 Thermal Plume Mapping

Thirty-three plume surveys were conducted at various river flow conditions and station operation levels. The discharge temperatures were within the limits established in the ETS. A return of the discharge temperature to within 2.7 C of ambient was used to define the plume. In 28 of 33 surveys the plume was limited to 5 m offshore and 25 m downstream from the Discharge.

POOR ORIGINAL

The analytical plume model for normal cooldown conditions was compared with the cooldown for refueling on 21 February. The plume was recorded no further than 20 m offshore and 1000 m downstream from the Discharge. This varies from the predicted model presented in the environmental statement for the operation of TMINS. High river flow during the cooldown operations may account for this variance.

1.1.5 Effects of Cooling Tower Salt Drift on Agricultural Crops and Natural Vegetation

1.1.5.1 Plant Pathogens

Plant pathology transects were examined from April through October 1976. No differences were noted in flowering time or appearance of the 219 taxa observed with respect to the location of possible salt drift. Plant parasitic diseases were found on four agricultural crops and 21 taxa of natural vegetation, and insect damage was noted on nine taxa. None of the damage caused significant defoliation and no pattern was observed relative to the operation of the cooling towers at TMINS.

1.1.5.2 Quantitative Vegetation Studies

Two forests and four fields were surveyed late August through mid-October 1976; results were statistically compared with those obtained in 1973 and 1975. There were few changes in the overstory and understory in the forests. Some of the statistically significant changes in ground cover in forests and fields were related to natural or human disturbance; others were normal in the course of secondary succession. No pattern of change was found that was attributed to the operation of the cooling towers at TMINS.

2.0 FISH

The ETS, Appendix B, Section 4.1.1D requires replicate fish samples be taken both inside and outside of the thermal plume every two weeks, March through October.

POOR ORIGINAL

2.1 METHODS

Fish were sampled every two weeks at four trapnet and five seine stations, March through October 1976 (Table 2.1-1 and Figure 2.1-1). High river flows during June and October necessitated collections be taken on succeeding weeks. Trapnet collections taken on 29 June through 1 July were analyzed as June data.

Habitat differences in water velocity, depth, substrate, and available cover were observed at the stations. Riffles were noted at the upstream seine stations during low river flow; no riffles were encountered downstream. Mud and silt were common substrates downstream while mud, rubble, and boulders predominated upstream. Rubble, boulders, and vegetation provided limited cover. Water depths ranged to 2 m.

Fishes taken by trapnet and seine since 1974 are listed in Table 2.1-2. Common and scientific names and taxonomic order of presentation followed Bailey et al. (1970).

References used for fish identification included Denoncourt (1975), Gibbs (1957), Hubbs and Lagler (1964), Pflieger (1975), Scott and Crossman (1973), Snelson (1968), and Trautman (1957).

Identification of young of the white sucker from those of the shorthead redhorse was difficult. Young were distinguishable only upon internal examination of gas bladder chambers. Therefore, specimens were listed as white sucker/shorthead redhorse until they were large enough to be identified by external characteristics.

Condition factor (K) for fishes comprising more than 10% of the trapnet or seine catch during 1974, 1975, or 1976 was calculated using the formula:

$$K = 100W/L^3$$

where W = mean weight (g) per 5 mm group, and L = upper limit of 5 mm fork length interval expressed in cm.

Species diversity indices (D) were calculated for each trapnet and seine station using the Shannon-Weaver function presented by Lloyd et al. (1968):

$$D = C/N(N\log_{10}N - \sum n_i \log_{10} n_i)$$

where C = 3.321928 (converts base 10 log to base 2), N = total number of individuals, and n_i = total number of individuals in the i^{th} species.

An index was computed to identify the percent similarity between stations with respect to composition of fishes (Whittaker and Fairbanks 1958). It was expressed as:

$$PSc = \sum \min(a,b)$$

where PSc = the percent similarity and a and b = the percentages of a species in samples A and B. PSc values range from 0.0 (no similarity) to 100.0 (complete similarity). This index measures relative similarity in terms of species populations and often leads to grouping of communities by dominants or major species.

POOR ORIGINAL

Kendall's coefficient of rank correlation (Sokal and Rohlf 1973) was applied to the catch data to analyze the yearly variation in rankings of species at a station. This did not test whether numbers collected in different years were significantly different, only whether their respective rankings were correlated (Summerfelt and Minckley 1969).

Physicochemical data included time, weather, secchi disc, and air and water temperatures. Dissolved oxygen concentration and pH were determined from water samples taken at each station. River stage was obtained from the Harrisburg River Gauge Station for 0700 hr. Data for trapnet catches were presented as two, separate 24-hr collections. Minimum values for parameters were listed first regardless of collection date. Single recordings for a parameter indicate identical observations throughout the period.

Each trapnet consisted of a 0.91 m by 15.24 m lead net and a 0.91 m by 1.83 m metal frame connected to two traps (4, 0.76 m diameter hoops). The lead net and trapnet were of 1.27 cm mesh. Nets were set for 24-hr, were checked, and reset for a second 24-hr period. Effort was made to set nets perpendicular to shore; however, high flows often caused nets to be set at angles of 45 degrees or less to shore to prevent rolling. Fishes were identified, measured, weighed, and released in the field.

A 3.05 m by 1.22 m seine with 0.32 cm mesh was used; at least three hauls were made for each collection. Additional hauls were taken when further effort might alter the relative abundance of fishes or yield other species. Fishes were preserved in 10% formalin for one week, rinsed in water and let stand for two days, and stored in 40% isopropanol.

POOR ORIGINAL

1565 057

Specimens were measured to within a 5 mm fork length interval. All fish of a species within the same interval in each collection were weighed to the nearest 0.1 g. A subsample was measured and weighed when a large number (100+) of one species was taken in a collection.

Reproductive status for fishes was defined as follows: young were spawned during the current calendar year; juveniles were incapable of reproduction, or minnows and darters less than 26 mm collected prior to the current spawning season; and adults were capable of reproduction. Classifications were based on field observations and information in the literature (Carlander 1953, 1969; Miller and Buss 1963; Scott and Crossman 1973; Trautman 1957).

Fishes were examined for ectoparasites.

POOR ORIGINAL

2.2 RESULTS

2.2.1 TRAPNET

Results of March through October trapnet collections are reported in Tables 2.2-1 through 2.2-18 and are summarized in Tables 2.2-19 through 2.2-24. A total of 144 trapnet collections (36 upstream from the Discharge and 108 downstream) yielded 822 fish of 25 species (Tables 2.2-23 and 2.2-24). Most fish (295) and most species (20) were taken at Stations 1A3 and 11A2, respectively. The number of specimens per collection (n/Coll.) was 8.19 upstream and 4.88 downstream (Table 2.2-24). Except for the white sucker and northern hog sucker, all species were taken in equal or greater numbers downstream. Catch per month was greatest at three of the four stations (1A3, 11A2, 9B2) in September (Tables 2.2-19 through 2.2-22).

1565 058

Sunfishes and catfishes dominated the catch. The five most abundant fishes (74.5% of the total catch) were the pumpkinseed, channel catfish, rock bass, black crappie, and redbreast sunfish (Table 2.2-23).

Nine sunfishes comprised 62.5% of the trapnet catch. The pumpkinseed ranked first in overall abundance (26.0%) and was the most common species at Stations 1A3 and 9B2 (Table 2.2-23). Other sunfishes that comprised more than 5.0% of the catch were the rock bass (11.7%), black crappie (10.1%), and redbreast sunfish (8.6%).

Five catfishes accounted for 25.1% of the catch; slightly greater numbers were taken downstream (Table 2.2-24). The channel catfish (18.1%) and brown bullhead (5.0%) were most common.

Two juvenile alewife were captured at Station 9B2 on 13-14 September (Table 2.2-15). This species had not been recorded from the lower Susquehanna drainage in Pennsylvania since the 1930's (Fowler 1940). Introductions were made in 1969 into impoundments in the Susquehanna watershed in Centre, Columbia, and Luzerne counties (Robert B. Hesser, Pennsylvania Fish Commission, personal communication). The specimens may have migrated downstream from one of these impoundments.

Other fishes taken for the first time by trapnet included the muskellunge, northern hog sucker, yellow perch, and walleye. Four species previously taken by trapnet, the goldfish, bluntnose minnow, fallfish, and tessellated darter were not collected in 1976.

POOR ORIGINAL

1565 059

POOR ORIGINAL

Diversity indices calculated from summary data for each station ranged from 2.95 (1A3) to 3.35 (11A2) Table 2.2-23. Monthly indices at most stations peaked in July or August and ranged from 0.00 at 11A3 in October to 3.24 at 11A2 in August (Tables 2.2-19 through 2.2-22). Lower diversity indices reflected the dominance of a single species.

Percent similarity indices between stations were moderate (Table 2.2-25). The greatest similarity (71.2) was between Stations 1A3 and 11A2; it was caused by the dominance of the channel catfish and rock bass. The similarity between Stations 1A3 and 9B2 (66.1) was characterized by like habitats and dominance by the pumpkinseed. The least similarity of 49.4, between Stations 11A3 and 9B2, was caused by dissimilar habitats and the absence of common dominant species.

2.2.2 SEINE

Results of March through October seine collections for each date are presented in Tables 2.2-27 through 2.2-44 and are summarized in Tables 2.2-45 through 2.2-51. A total of 90 collections (36 upstream from the Discharge and 54 downstream) yielded 10,478 fish of 35 species (Tables 2.2-50 and 2.2-51). Most fish (2,645) and most species (29) were taken at Stations 1A2 and 16A1, respectively. The numbers of specimens per collection upstream and downstream were comparable (136.50 and 103.04, respectively). Most dominant species showed nearly equal distribution among upstream and downstream stations.

1565 060

Seine catches were small and erratic from March through May; only 48 specimens were collected in May (Table 2.2-51). The catch reached a peak in June (3,611 fish) and corresponded with a large spawn of the spottail shiner. Catches at all stations except 1A2 decreased during July and August. A secondary peak of 2,050 fish was recorded in September when young of the spotfin shiner were abundant. The number of specimens per collection was similar at all stations except 9A1 (Table 2.2-50). Fewest fish (1,006) and least species (19) were taken at Station 9A1. Seines were difficult to fish at Station 9A1 because of boulders and deep mud.

The spottail shiner comprised 52.7% of the catch and was the most abundant species at all stations (Table 2.2-50). The spotfin shiner ranked second in overall abundance (19.8%); nearly half of the specimens were taken at Station 1A2. Young of the white sucker/shorthead redhorse accounted for 6.7% of the catch and were most common at Station 16A1. The tessellated darter ranked fourth in overall abundance (6.5%) and was most common in September. Young of the channel catfish ranked fifth in overall abundance (4.7%); more than 99% were taken downstream from the Discharge (Table 2.2-51).

Fishes taken for the first time from the study area by seine included the fathead minnow, yellow bullhead, and shield darter. The yellow perch was the only species taken in previous years not collected in 1976.

Overall station diversity indices were low due to dominance by the spottail shiner and spotfin shiner and ranged from 1.75 (1A2) to 2.45 (10A2) Table 2.2-50. The highest monthly index (2.71) occurred at Station 1A2 in August (Table 2.2-45).

POOR ORIGINAL

1565 061

Percent similarity indices between stations were high (Table 2.2-26). The greatest similarity (82.0) occurred between downstream Stations 10A2 and 9A1. The lowest similarity (64.4) was found between the two upstream stations, 1A2 and 16A1, and resulted from differences in abundance of the spotfin shiner and suckers. Similarities between upstream and downstream stations were reduced by the unequal distribution of the channel catfish. Similarities seemed less dependent on the presence of like habitats and more dependent on affinities of dominant species.

2.2.3 REPRODUCTIVE STATUS AND CONDITION FACTOR

Reproductive status and condition factor (K) per 5 mm fork length interval for the channel catfish, rock bass, pumpkinseed, white crappie, and black crappie taken by trapnet and the spottail shiner, spotfin shiner, and white sucker taken by seine are presented in Tables 2.2-52 through 2.2-59. Mean weights per 5 mm fork length intervals of fishes taken by trapnet and seine are given in Tables 2.2-60 through 2.2-95.

Juvenile channel catfish were common in trapnet catches during March, April, September, and October; most adults were taken in October. Young channel catfish first appeared in seine catches on 7 July; this may indicate that spawning began in June. Most rock bass taken by trapnet were adults. Ripe male and female pumpkinseed were common in June and July trapnet catches. Young of the white crappie and black crappie were taken by trapnet in September.

POOR ORIGINAL

1565 062

POOR ORIGINAL

Most spottail shiners taken by seine were young or juvenile; young were first collected in June. Spottails spawned in May and June grew to 50-60 mm FL by October. The spotfin shiner appeared to have an extended spawning season with peaks in June and August. Winter survival of young spotfins of the 1975 year class was good as indicated by the abundance of juveniles in spring 1976 seine catches. Most white suckers spawned in June; young were common in July seine catches.

No appreciable differences were noted in condition factors or weights downstream and upstream from the Discharge where sufficient numbers were present; most values were within the ranges observed in previous years.

2.2.4 PARASITES

The fish leech, Myzobdella lugubris, was a common parasite of the tessellated darter. Infestation on darters was first observed in August and reached a peak in October. Some darters were parasitized by up to five leeches. The site of attachment was always on or near a fin. No parasitized darters smaller than 31 mm were observed. One adult channel catfish was also parasitized. M. lugubris shows the greatest distribution of any piscicolid reported in North America (Hugghins 1972) and is probably the most abundant fish leech of catfishes in the Midwest (Klemm 1972).

Anchor worms (Lernaea spp.) were found on a few specimens of the comely shiner, spottail shiner, spotfin shiner, bluntnose minnow, bluegill, and smallmouth bass. Most of these infected fishes were in poor condition.

A slight infection of black spot, caused by metacercariae of digenetic trematodes, was observed on one juvenile creek chub.

1565 063

POOR ORIGINAL

2.3 DISCUSSION

Trapnet catches have declined since the inception of the program in 1974 (Table 2.3-1). The smallest yearly catch (822) occurred in 1976 and was roughly half of the 1975 catch (1,610). The decline in the 1976 catch resulted from decreases in the number of fish taken at the downstream stations. The upstream catches in 1975 and 1976 were comparable (324 and 295, respectively). The number of specimens per upstream collection increased from 6.35 in 1975 to 8.19 in 1976. The total number of specimens captured in 1974 and 1975 was inflated by large collections of juvenile channel catfish downstream from the Discharge. No large collections of channel catfish occurred in 1976. Variation in the relative abundance of some species may have resulted from fluctuations in year class strength. Results of Kendall's coefficient of rank correlation tests showed no significant changes ($P \geq .05$) in species ranks at individual stations during 1974 through 1976 (Table 2.3-2).

Fluctuations in yearly seine catches resulted from large differences in the numbers of specimens taken upstream from the Discharge (Table 2.3-1). Catch data from downstream stations were similar throughout the study period. Catches were most influenced by the availability of young of the spottail shiner, spotfin shiner, and white sucker/shorthead redhorse. Results of Kendall's coefficient of rank correlation tests showed significant differences ($P \geq .05$) in species ranks at Stations 1A2 (upstream from the Discharge) and 9A1 (downstream from the Discharge) in 1975 and 1976 (Table 2.3-2).

1565 064

It is concluded that the impact from the operation of Unit 1 on the populations of fishes vulnerable to trapnet and seine was negligible. The ETS requirements for Unit 1 are fulfilled and programs will continue as specified in the ETS for Unit 2.

Bailey, R.M., J.E. Fitch, E.S. Herald, E.A. Lachner, C.C. Lindsey, C.R. Robins, and W.B. Scott. 1970. A list of common and scientific names of fishes from the United States and Canada. Amer. Fish. Soc. Special Publ. No. 6. 150 pp.

Carlander, K.D. 1953. Handbook of freshwater fishery biology with the first supplement. Wm. C. Brown Co., Dubuque, Iowa. 430 pp.

_____. 1969. Handbook of freshwater fishery biology. Vol. 1. Life history data on freshwater fishes of the United States and Canada, exclusive of the Perciformes. Iowa State Univ. Press. Ames, Iowa. 752 pp.

Denoncourt, R.F. 1975. Key to the families and genera of Pennsylvania freshwater fishes and the species of freshwater fishes of the Susquehanna River drainage above Conowingo Dam. Proc. Pa. Acad. Sci. 49:82-88.

Fowler, H.W. 1940. A list of the fishes recorded from Pennsylvania. Comm. of Pa., Bd. Fish Comm. Bull. 7. 25 pp.

Gibbs, R.H., Jr. 1957 Cyprinid fishes of the subgenus Cyprinella of Notropis. II. Distribution and variation of Notropis spilopterus, with the description of a new subspecies. Lloydia 20(3):186-211.

Hubbs, C.L. and K.F. Lagler. 1964. Fishes of the Great Lakes region Univ. Mich. Press, Ann Arbor, Mich. 213 pp.

Hugghins, E.J. 1972. Parasites of fishes in South Dakota. South Dakota Dept. Game, Fish, and Parks. Bull. 484. 73 pp.

Klemm, D.J. 1972. The leeches (Annelida:Hirudinea) of Michigan. Mich. Academician IV(4):405-444.

Lloyd, M., J.H. Zar, and J.R. Karr. 1968. On the calculation of information-theoretical measures of diversity. Amer. Midl. Nat. 79(2): 257-272.

POOR ORIGINAL

1565 065

Miller, J. and K. Buss. [1963?] . The age and growth of the fishes in Pennsylvania. Pa. Fish Comm. 26 pp.

Pfleiger, W.L. 1975. The fishes of Missouri. Missouri Dept. of Cons. 343 pp.

Scott, W.B. and E.J. Crossman. 1973. Freshwater fishes of Canada. Fish. Res. Bd. Can. Bull. 184. 966 pp.

Snelson, F.F., Jr. 1968. Systematics of the Cyprinid fish Notropis amoenus, with comments on the subgenus Notropis. Copeia 1968 (4): 776-802.

Sokal, R.R. and F.J. Rohlf. 1973. Introduction to biostatistics. W.H. Freeman and Co. San Fransisco, Ca. 368 pp.

Summerfelt, R.C. and C.O. Minckley. 1969. Aspects of the life history of the sand shiner, Notropis stramineus (Cope), in the Smoky Hill River, Kansas. Trans. Am. Fish. Soc. 98(3):444-453.

Trautman, M.B. 1957. The fishes of Ohio with illustrated keys. Ohio State Univ. Press, Columbus, Ohio. 683 pp.

Whittaker, R.H. and C.W. Fairbanks. 1958. A study of plankton copepod communities in the Columbia Basin, Southeastern Washington. Ecology 39:46-65.

POOR ORIGINAL

1565 066

POOR ORIGINAL

Table 2.1-1

Location of trapnet and seine stations.

Station Number	Location
TRAPNET	
	UPSTREAM
TM-AQF-1A3*	Off southwest shore of St. Johns Island.
	DOWNSTREAM
TM-AQF-11A2	TMINS Discharge.
TM-AQF-11A3	200 m downstream from TMINS Discharge.
TM-AQF-9B2	1900 m downstream from TMINS Discharge.
SEINE	
	UPSTREAM
TM-AQF-1A2	Northwest St. Johns Island.
TM-AQF-16A1	25 m upstream from TMI boat dock.
	DOWNSTREAM
TM-AQF-10A2	150 m downstream from TMINS Discharge.
TM-AQF-9A1	1500 m downstream from TMINS Discharge.
TM-AQF-9B3	2000 m downstream from TMINS Discharge.

* Polar coordinate prefix TM-AQF- deleted from station numbers for discussion in text.

1565 067

POOR ORIGINAL

Table 2.1-2

List of common and scientific names of fishes taken by trapnet and seine during 1974, 1975, and 1976 in the Susquehanna River in the vicinity of TMINS.

Common Name	Scientific Name	Trapnet			Seine		
		1974	1975	1976	1974	1975	1976
Alewife	Alosa pseudoharengus (Wilson)	-	-	x	-	-	-
Muskellunge	Esox masquinongy Mitchill	-	-	x	-	-	-
Goldfish	Carassius auratus (Linnaeus)	x	-	-	-	-	-
Carp	Cyprinus carpio Linnaeus	x	x	x	-	x	x
Cutlips minnow	Exoglossum maxillingua (Lesueur)	-	-	-	x	-	x
River chub	Nocomis micropogon (Cope)	-	-	-	x	x	x
Golden shiner	Notemigonus crysoleucas (Mitchill)	x	x	x	x	x	x
Comely shiner	Notropis amoenus (Abbott)	-	-	-	x	x	x
Common shiner	Notropis cornutus (Mitchill)	-	-	-	x	x	x
Spottail shiner	Notropis hudsonius (Clinton)	x	x	x	x	x	x
Swallowtail shiner	Notropis procne (Cope)	-	-	-	x	x	x
Rosyface shiner	Notropis rubellus (Agassiz)	-	-	-	-	x	x
Spotfin shiner	Notropis spilopterus (Cope)	x	x	x	x	x	x
Bluntnose minnow	Pimephales notatus (Rafinesque)	-	x	-	x	x	x
Fathead minnow	Pimephales promelas Rafinesque	-	-	-	-	-	x
Blacknose dace	Rhinichthys atratulus (Hermann)	-	-	-	x	x	x
Longnose dace	Rhinichthys cataractae (Valenciennes)	-	-	-	x	x	x
Creek chub	Semotilus atromaculatus (Mitchill)	-	-	-	x	x	x
Fallfish	Semotilus corporalis (Mitchill)	x	-	-	x	x	x
Quillback	Carpiodes cyprinus (Lesueur)	x	x	x	x	x	x
White sucker	Catostomus commersoni (Lacepede)	x	x	x	x	x	x
Northern hog sucker	Hypentelium nigricans (Lesueur)	-	-	x	x	x	x
Shorthead redhorse	Moxostoma macrolepidotum (Lesueur)	x	x	x	x	x	x
White catfish	Ictalurus catus (Linnaeus)	x	x	x	x	-	x
Yellow bullhead	Ictalurus natalis (Lesueur)	x	x	x	-	-	x
Brown bullhead	Ictalurus nebulosus (Lesueur)	x	x	x	x	-	x
Channel catfish	Ictalurus punctatus (Rafinesque)	x	x	x	x	x	x
Margined madtom	Noturus insignis (Richardson)	x	x	x	-	-	-
Rock bass	Ambloplites rupestris (Rafinesque)	x	x	x	x	x	x
Redbreast sunfish	Lepomis auritus (Linnaeus)	x	x	x	x	x	x
Pumpkinseed	Lepomis gibbosus (Linnaeus)	x	x	x	x	x	x
Bluegill	Lepomis macrochirus Rafinesque	x	x	x	x	x	x
Smallmouth bass	Micropterus dolomieui Lacepede	x	x	x	x	x	x
Largemouth bass	Micropterus salmoides (Lacepede)	x	x	x	x	x	x
White crappie	Pomoxis annularis Rafinesque	x	x	x	x	x	x
Black crappie	Pomoxis nigromaculatus (Lesueur)	x	x	x	x	x	x
Tessellated darter	Etheostoma olmstedi Storer	-	x	-	x	x	x
Banded darter	Etheostoma zonale (Cope)	-	-	-	x	x	x
Yellow perch	Perca flavescens (Mitchill)	-	-	x	-	x	-
Shield darter	Percina peltata (Stauffer)	-	-	-	-	-	x
Walleye	Stizostedion vitreum vitreum (Mitchill)	-	-	x	-	-	-

1565 068

Table 2.2-1

Fishes taken by trapnet on 3-5 March 1976 in the vicinity of IMINS.

Station	IM-AVE-1A1		IM-AVE-1A2		IM-AVE-1A3		IM-AVE-2B2		Total	% Catch
Date	3-4	4-5	3-4	4-5	3-4	4-5	3-4	4-5		
Time	0940-0945	0950-0955	1000-1004	1007-0905	1015-1015	1020-0912	1030-1030	1032-0935		
Air Temp. (C)	3.0, 7.0	7.0, 9.0	3.0, 6.0	6.0, 9.0	3.0, 6.0	6.0, 11.5	3.0, 6.0	6.0, 10.5		
Water Temp. (C)	5.5	5.5, 6.0	5.0, 5.5	5.5, 6.0	5.0, 5.5	5.5, 6.0	5.5, 5.5	5.0, 6.0		
Dissolved Oxygen (ppm)	9.4	9.4, 9.9	9.8, 10.2	9.8	9.6, 10.0	9.6	9.3, 10.0	9.3, 9.8		
pH	7.9, 8.2	8.2, 8.3	8.2, 8.4	7.9, 8.4	8.0, 8.1	8.0, 8.1	8.0	7.9, 8.0		
Secchi Disc (cm)	51, 58	82, 83	33, 33	53	66, 58	51, 58	61, 64	51, 64		
River Stage (ft)	6.45, 6.47	6.47, 8.20	6.45, 6.47	6.47, 8.20	6.45, 6.47	6.47, 8.20	6.45, 6.47	6.47, 8.20		
Weather	Light Rain, Fog	Fog	Fog	Fog	Fog	Fog	Fog	Fog		
No. of Spec.	12	-	3	1	1	2	-	2	21	
No. of Spp.	3	-	2	1	1	2	-	2	7	
Spottail shiner	5		-	-	-	-		-	5	23.8
White sucker	1	NO	-	-	-	-	NO	-	1	4.8
Shorthead redhorse	-		1	-	-	-		-	1	4.8
Channel catfish	6	FISH	2	1	-	1	FISH	1	11	52.4
Margined madtom	-		-	-	-	1		-	1	4.8
Bluegill	-	TAKEN	-	-	1	-	TAKEN	-	1	4.8
Ballyre	-		-	-	-	-		1	1	4.8

Table 2.2-2

Fishes taken by trapnet on 15-17 March 1976 in the vicinity of IMINS.

Station	IM-AVE-1A1		IM-AVE-1A2		IM-AVE-1A3		IM-AVE-2B2		Total	% Catch
Date	15-16	16-17	15-16	16-17	15-16	16-17	15-16	16-17		
Time	1410-1305	1313-1308	1425-1325	1330-1350	1430-1335	1337-1355	1445-1345	1347-1410		
Air Temp. (C)	5.0, 14.0	.0, 5.0	5.5, 14.0	-1.0, 5.5	4.0, 14.0	0.0, 4.0	4.0, 16.0	-1.0, 4.0		
Water Temp. (C)	5.0, 7.0	3.5, 5.6	5.0, 7.0	2.5, 5.0	5.0, 6.0	3.0, 5.0	5.0, 7.0	5.0		
Dissolved Oxygen (ppm)	7.9, 9.6	7.9, 10.7	8.9, 10.8	8.9, 10.0	9.3, 9.8	9.3, 10.6	8.7, 9.4	8.7		
pH	7.8, 8.1	7.9, 8.1	7.9, 8.1	7.7, 8.1	8.0, 8.1	7.8, 8.1	8.0, 8.1	8.1		
Secchi Disc (cm)	58, 89	84, 89	46, 69	61, 69	51, 76	61, 76	61, 89	89		
River Stage (ft)	5.68, 5.84	5.60, 5.68	5.68, 5.84	5.60, 5.68	5.68, 5.84	5.60, 5.68	5.68, 5.84	5.60, 5.68		
Weather	Partly Cloudy, Light Rain	Light Rain, Partly Cloudy	Partly Cloudy, Light Rain	Light Rain, Partly Cloudy	Partly Cloudy, Light Rain	Light Rain, Partly Cloudy	Partly Cloudy, Light Rain	Light Rain, Partly Cloudy		
No. of Spec.	13	1	-	-	-	1	5	1	21	
No. of Spp.	7	1	-	-	-	1	3	1	10	
White sucker	1	-				-	-	-	1	4.8
Northern hog sucker	2	-				-	-	-	2	9.5
Shorthead redhorse	1	-				-	-	-	1	4.8
Brown bullhead	-	-				-	1	1	2	9.5
Channel catfish	6	1	NO	FISH	TAKEN	-	3	-	10	47.6
Margined madtom	1	-				-	-	-	1	4.8
Rock bass	-	-				-	1	-	1	4.8
Redbreast sunfish	-	-				1	-	-	1	4.8
Pumpkinseed	1	-				-	-	-	1	4.8
White crappie	1	-				-	-	-	1	4.8

POOR ORIGINAL

1565 069

Table 2.2-3

Fishes taken by trapnet on 29-31 March 1976 in the vicinity of TMI2.

Station	TM-AQE-1A1		TM-AQE-1A2		TM-AQE-1A3		TM-AQE-902		Total	% Catch
Date	29-30	30-31	29-30	30-31	29-30	30-31	29-30	30-31		
Time	1445-1525	1428-1520	1430-1460	1466-1460	1450-1450	1456-1458	1450-1405	1502-1500		
Air Temp. (C)	15.0, 16.5	13.0, 16.5	14.5, 16.5	13.0, 16.5	14.5, 16.5	13.0, 16.5	14.5	13.0, 14.5		
Water Temp. (C)	10.0, 10.5	10.0	10.0, 10.5	9.5, 10.0	10.0, 10.5	9.5, 10.0	10.0, 10.5	9.5, 10.0		
Dissolved Oxygen (ppm)	9.2, 9.4	8.6, 9.4	9.2, 9.4	8.2, 9.4	9.2, 9.4	8.8, 9.4	9.3, 9.4	8.1, 9.4		
pH	7.8, 8.2	7.8, 8.1	7.9, 8.1	7.9, 8.4	7.7, 7.9	7.7, 8.2	7.9, 8.0	7.9, 8.3		
Secchi Disc (cm)	38, 58	58, 69	33	33, 86	56, 56	56, 66	61, 71	71, 91		
River Stage (ft)	5.52, 5.53	5.53	5.52, 5.53	5.53	5.52, 5.53	5.53	5.52, 5.53	5.53		
Weather	Overcast	Overcast, Light Rain	Overcast	Overcast, Light Rain	Overcast	Overcast, Light Rain	Overcast	Overcast, Light Rain		
No. of Spmn.	6	8	1	-	1	2	4	5	27	
No. of Spp.	3	3	1	-	1	1	3	2	11	
Carp	-	1	-		-	-	-	-	1	3.7
Spottail shiner	1	-	-		-	-	-	-	1	3.7
White catfish	-	-	-		-	-	1	-	1	3.7
Brown bullhead	1	-	-		-	-	-	-	1	3.7
Channel catfish	4	6	-		-	-	1	-	11	40.7
Margined sculpin	-	-	-	FISH	1	-	-	-	1	3.7
Rock bass	-	-	-		-	2	-	-	2	7.4
Pumpkinseed	-	-	-		-	-	-	4	4	14.8
Smallmouth bass	-	-	-	TAKEN	-	-	-	1	1	3.7
White crappie	-	1	1		-	-	-	-	2	7.4
Black crappie	-	-	-		-	-	2	-	2	7.4

Table 2.2-4

Fishes taken by trapnet on 13-15 April 1976 in the vicinity of TMI2.

Station	TM-AQE-1A3		TM-AQE-1A2		TM-AQE-1A3		TM-AQE-902		Total	% Catch
Date	13-14	14-15	13-14	14-15	13-14	14-15	13-14	14-15		
Time	1300-1348	1352-1355	1310-1400	1407-1410	1320-1420	1422-1422	1328-1428	1431-1435		
Air Temp. (C)	15.5, 23.0	20.0, 25.0	17.0, 19.0	19.0, 24.0	16.0, 22.0	22.0, 24.5	16.0, 22.0	22.0, 24.0		
Water Temp. (C)	10.0, 12.5	12.5, 13.0	9.0, 12.0	12.0, 13.0	9.0, 11.5	11.5, 13.0	11.0, 12.0	12.0, 13.0		
Dissolved Oxygen (ppm)	10.4	9.4, 10.4	10.6, 10.8	9.5, 10.6	10.2, 10.6	9.5, 10.2	9.9, 10.5	9.3, 9.7		
pH	7.6, 7.8	7.8, 8.1	7.6, 7.8	7.8, 7.9	7.6, 7.8	7.8, 7.9	7.5, 7.6	7.5, 7.8		
Secchi Disc (cm)	122	112	117	76	122	91	117	91		
River Stage (ft)	4.72, 4.85	[illegible]	4.72, 4.83	4.61, 4.72	4.72, 4.83	4.61, 4.72	4.72, 4.83	4.61, 4.72		
Weather	Clear	Clear, Partly Cloudy	Clear	Clear, Partly Cloudy	Clear	Clear, Partly Cloudy	Clear	Clear, Partly Cloudy		
No. of Spmn.	2	4	12	6	-	1	3	3	31	
No. of Spp.	2	3	3	3	-	1	3	3	7	
Spottail shiner	-	-	6	-		-	-	-	6	19.4
Northern hog sucker	1	-	-	-	SEE	-	-	-	1	3.2
White catfish	-	1	-	-		-	-	-	1	3.2
Channel catfish	-	-	4	1	FISH	-	1	-	6	19.4
Rock bass	1	2	2	4		-	-	1	10	32.3
Redbreast sunfish	-	-	-	1	TAKEN	1	1	1	4	12.9
Pumpkinseed	-	1	-	-		-	1	1	3	9.7

POOR ORIGINAL

1565 070

Table 2.2-5

Fishes taken by trapnet on 26-28 April 1976 in the vicinity of TMINS.

Station	TM-AQF-1A3		TM-AQF-11A2		TM-AQF-11A3		TM-AQF-982		Total	% Catch
Date	26-27	27-28	26-27	27-28	26-27	27-28	26-27	27-28		
Time	0930-0850	0855-0810	0948-0925	0932-0836	1007-0937	0944-0844	1050-1027	1045-0914		
Air Temp. (C)	5.5, 9.0	5.5, 7.5	8.0, 9.0	8.0, 9.0	6.0, 9.0	6.0, 8.5	5.0, 9.0	5.0, 8.5		
Water Temp. (C)	11.0, 15.0	10.0, 11.0	11.0, 15.0	11.0	11.0, 15.0	11.0	11.0, 15.0	10.0, 11.0		
Dissolved Oxygen (ppm)	6.5, 8.1	8.1, 8.3	7.0, 8.9	8.9, 9.6	7.1, 8.9	8.9, 9.3	6.7, 8.6	8.6, 9.3		
pH	8.1, 8.2	8.1	8.0, 8.1	7.8, 8.0	8.1, 8.2	8.0, 8.1	8.1	7.5, 8.1		
Secchi Disc (cm)	30, 58	53, 58	38, 53	53, 61	38, 61	51, 61	33, 38	33, 61		
River Stage (ft)	4.33, 4.40	4.40, 4.48	4.33, 4.40	4.40, 4.88	4.33, 4.40	4.40, 4.88	4.33, 4.40	4.40, 4.88		
Weather	Overcast, Clear	Clear, Partly Cloudy	Overcast, Partly Cloudy	Partly Cloudy	Overcast, Partly Cloudy	Partly Cloudy	Overcast	Overcast, Partly Cloudy		
No. of Spec.	15	11	3	1	3	1	17	6	57	
No. of Spp.	5	4	3	1	3	1	4	2	6	
Carp	-	-	-	-	1	-	-	-	1	1.8
Brown bullhead	2	-	-	-	-	-	6	-	8	14.0
Channel catfish	1	2	1	1	1	1	5	1	13	22.8
Rock bass	2	2	1	-	1	-	1	-	7	12.3
Redbreast sunfish	1	2	1	-	-	-	-	-	4	7.0
Pumpkinseed	9	5	-	-	-	-	5	5	24	42.1

Table 2.2-6

Fishes taken by trapnet on 10-12 May 1976 in the vicinity of TMINS.

Station	TM-AQF-1A3		TM-AQF-11A2		TM-AQF-11A3		TM-AQF-982		Total	% Catch
Date	10-11	11-12	10-11	11-12	10-11	11-12	10-11	11-12		
Time	1330-1258	1305-1325	1400-1335	1340-1405	1408-1342	1348-1415	1448-1430	1346-1505		
Air Temp. (C)	22.0, 25.0	19.0, 22.0	22.0, 24.5	17.5, 22.0	22.0, 24.5	16.5, 22.0	20.0, 24.5	18.0, 20.0		
Water Temp. (C)	17.0, 17.5	17.0, 17.5	17.0, 17.5	17.0	17.5, 18.0	17.0, 17.5	17.5, 18.0	17.0, 17.5		
Dissolved Oxygen (ppm)	9.2, 10.6	8.5, 9.2	9.0, 10.0	8.7, 9.0	9.3, 10.4	8.7, 9.3	9.4, 10.6	8.8, 9.4		
pH	8.2, 8.5	7.9, 8.2	7.7, 7.8	7.7	7.7, 7.9	7.6, 7.7	8.0, 8.1	7.7, 8.1		
Secchi Disc (cm)	91	86, 91	51, 66	51, 61	91, 97	56, 91	66, 91	51, 66		
River Stage (ft)	4.41, 4.51	4.38, 4.41	4.41, 4.51	4.38, 4.41	4.41, 4.51	4.38, 4.41	4.41, 4.51	4.38, 4.41		
Weather	Clear, Overcast	Overcast, Clear	Clear, Overcast	Overcast, Clear	Clear, Overcast	Overcast, Clear	Clear, Overcast	Overcast, Clear		
No. of Spec.	13	10	-	1	11	5	31	15	88	
No. of Spp.	3	6	-	1	2	4	6	7	13	
Carp	-	1		-	-	-	-	-	1	1.1
Spottail shiner	-	1	20	-	-	-	-	-	1	1.1
Quillback	-	-		-	-	-	1	-	1	1.1
Yellow bullhead	-	-		-	-	-	1	1	2	2.3
Brown bullhead	1	-		-	-	-	-	-	1	1.1
Channel catfish	-	1	FISH	-	-	-	1	2	4	4.5
Rock bass	1	1		-	2	1	2	2	9	10.2
Redbreast sunfish	5	3		1	9	2	3	4	27	30.7
Pumpkinseed	5	3		-	-	1	20	3	32	36.4
Bluegill	1	-	TAKEN	-	-	-	-	2	3	3.4
Smallmouth bass	-	-		-	-	1	-	-	1	1.1
White crappie	-	-		-	-	-	1	-	1	1.1
Black crappie	-	-		-	-	-	4	1	5	5.7

POOR ORIGINAL

Table 2.2-7

Fishes taken by trapnet on 26-26 May 1976 in the vicinity of TMINS.

Station	TM-AQU-1A1		TM-AQU-1A2		TM-AQU-1A3		TM-AQU-982		Total	% Catch
Date	26-27	27-28	26-27	27-28	26-27	27-28	26-27	27-28		
Time	1438-1445	1448-1449	1610-1408	1419-1415	1403-1402	1406-1060	1333-1335	1337-1321		
Air Temp. (C)	12.0, 25.0	27.0, 25.0	12.5, 21.5	21.5, 22.0	12.5, 22.0	22.0	12.0, 26.0	22.0, 26.0		
Water Temp. (C)	14.5, 16.0	16.0, 18.0	14.5, 16.0	16.0, 18.0	14.5, 16.0	16.0, 18.0	14.5, 15.5	15.5, 17.5		
Dissolved Oxygen (ppm)	9.6	9.2	9.7	9.0	9.5	10.4	9.2	9.5		
pH	7.5, 7.7	7.3, 7.5	7.6	7.0, 7.5	7.5, 7.7	7.1, 7.5	7.5, 7.8	7.5, 7.6		
Secchi Disc (cm)	61	61, 66	58, 61	61, 64	61, 64	61, 71	64, 76	64, 91		
River Stage (ft)	5.08, 5.29	5.00, 5.08	5.08, 5.29	5.00, 5.09	5.08, 5.29	5.00, 5.08	5.08, 5.29	5.00, 5.08		
Weather	Overcast, clear	Clear, Partly Cloudy	Light Rain, clear	Clear, Partly Cloudy	Light Rain, clear	Clear, Partly Cloudy	Light Rain, clear	Clear, Partly Cloudy		
No. of Spec.	15	10	5	10	-	2	8	3	53	
No. of Spp.	3	6	3	6	-	2	2	4	8	
Spottin shiner	-	-	-	6	-	-	-	-	6	11.3
White sucker	-	-	-	-	NO	1	-	-	1	1.9
Brown bullhead	-	2	-	-		-	-	1	3	5.7
Channel catfish	2	1	-	-		-	2	-	5	9.4
Margined madtom	-	1	-	-	FISH	-	-	-	1	1.9
Rock bass	5	1	1	1		-	-	-	8	15.1
Redbreast sunfish	-	3	2	1		1	-	-	7	13.2
Bluegill	8	2	2	3	LAKES	-	6	2	22	41.5

Table 2.2-8

Fishes taken by trapnet on 7-5 June 1976 in the vicinity of TMINS.

Station	TM-AQU-1A1		TM-AQU-1A2		TM-AQU-1A3		TM-AQU-982		Total	% Catch
Date	7-8	8-9	7-8	8-9	7-8	8-9	7-8	8-9		
Time	1425-1447	1449-1415	1355-1409	1412-1330	1345-1356	1400-1320	1310-1320	1324-1245		
Air Temp. (C)	27.0, 28.0	28.0, 32.0	25.5, 29.0	29.0, 30.0	26.5, 28.0	28.0, 29.0	26.0, 27.5	27.5, 29.0		
Water Temp. (C)	21.0, 22.5	22.5, 25.0	21.0, 22.5	22.5, 23.5	21.0, 22.5	22.5, 23.5	21.0, 22.0	22.0, 23.5		
Dissolved Oxygen (ppm)	10.2, 10.4	9.4, 10.2	9.8, 10.4	9.2, 9.8	10.4	9.4, 10.4	10.2, 10.4	9.8, 10.4		
pH	8.6, 8.7	8.4, 8.6	8.5, 8.6	8.2, 8.5	8.5, 8.8	8.5, 8.8	8.6, 8.8	8.4, 8.8		
Secchi Disc (cm)	46	46	38, 48	38, 48	48, 51	48, 51	48, 51	51		
River Stage (ft)	4.54, 4.69	4.54, 4.59	4.54, 4.69	4.51, 4.59	4.54, 4.69	4.54, 4.59	4.54, 4.69	4.51, 4.59		
Weather	Clear	Clear	Partly Cloudy, Clear	Clear	Partly Cloudy, Clear	Clear	Partly Cloudy, Clear	Clear		
No. of Spec.	2	4	1	4	5	2	3	3	24	
No. of Spp.	2	3	1	3	3	2	2	3	7	
White sucker	-	-	-	-	1	-	-	-	1	4.2
Brown bullhead	-	-	-	1	-	-	-	1	2	8.3
Channel catfish	-	-	-	-	-	1	-	-	1	4.2
Rock bass	-	1	-	1	2	-	-	1	5	20.8
Redbreast sunfish	1	1	-	-	2	-	-	-	4	16.7
Purplenose	1	2	1	2	-	-	1	1	8	33.3
Black crappie	-	-	-	-	-	1	2	-	3	12.5

POOR ORIGINAL
1565 072

Table 2.2-9

Fishes taken by trawl on 29 June - 1 July 1976 in the vicinity of SHINE

Station	SH AVE 1A1		SH AVE 1A2		SH AVE 1A3		SH AVE 2A2		Total	% catch
Date	29-30	30-1	29-30	30-1	29-30	30-1	29-30	30-1		
Time	1507-1508	1510-1447	1432-1412	1420-1405	1405-1358	1405-1355	1331-1255	1258-1325		
Air Temp. (C)	23.5, 28.0	23.5, 25.0	26.5, 30.0	25.0, 26.5	26.0, 28.5	25.5, 26.0	26.0, 31.5	26.0, 27.0		
Water Temp. (C)	25.5, 27.5	23.0, 25.5	26.5, 27.0	23.5, 26.5	26.0, 27.0	23.5, 26.0	27.0, 27.5	23.5, 27.0		
Dissolved Oxygen (ppm)	9.0	NA	10.4	NA	10.4	NA	8.5, 10.8	8.5		
pH	8.0, 8.4	8.0	7.9, 8.3	7.8, 7.9	8.2	7.8, 8.2	8.3, 8.6	8.0, 8.3		
Secchi Disc (cm)	30, 33	3, 30	18	3, 18	30, 33	5, 30	30, 41	5, 30		
River Stage (ft)	4.71, 4.74	4.68, 4.74	4.71, 4.74	4.68, 4.74	4.71, 4.74	4.68, 4.74	4.71, 4.74	4.68, 4.74		
Weather	Partly Cloudy, Light Rain	Light Rain, Partly Cloudy	Light Rain, Overcast	Overcast, Partly Cloudy	Light Rain, Partly Cloudy	Partly Cloudy	Partly Cloudy, Overcast	Overcast, Partly Cloudy		
No. of Spps.	11	11	18	7	6	4	9	2	68	
No. of Spc.	6	2	8	6	5	4	5	1	14	
Carp	2	-	-	-	-	-	-	-	2	2.9
Quillback	-	-	-	-	-	-	1	-	1	1.5
White sucker	-	1	-	-	-	-	-	-	1	1.5
Shorthead redhorse	-	-	1	-	-	-	-	-	1	1.5
Brown bullhead	1	-	2	-	1	1	2	2	9	13.2
Channel catfish	4	-	3	1	1	-	2	-	10	14.7
Margined madtom	-	-	-	1	-	1	-	-	2	2.9
Rock bass	1	1	2	2	2	1	-	-	13	19.1
Redbreast sunfish	1	-	-	-	1	1	-	-	3	4.4
Pumpkinseed	1	7	3	1	-	-	1	-	13	19.1
Smallmouth bass	-	-	1	-	-	-	-	-	1	1.5
White crappie	-	-	1	-	-	-	-	-	1	1.5
Black crappie	-	-	5	1	1	-	3	1	10	14.7
Walleye	-	-	-	1	-	-	-	-	1	1.5

NA = Not Available.

POOR ORIGINAL

1565 073

Table 2-2-10

Fishes taken by trapnet on 6-8 July 1976 in the vicinity of TMI-2.

POOR ORIGINAL

1565 074

Table 2.2-11

Fishes taken by trapnet on 19-21 July 1976 in the vicinity of TMI2S.

Station	IN ARE 1A1		IN ARE 1A2		IN ARE 1A3		IN ARE 1A4		Total	% Catch
Date	19-20	20-21	19-20	20-21	19-20	20-21	19-20	20-21		
Time	0922-1114	1127-1009	0955-1150	1155-1033	1003-1206	1210-1040	1043-1243	1249-1119		
Air Temp. (C)	21.5, 27.0	25.0, 27.0	24.5, 28.0	24.5, 28.0	25.0, 26.5	25.5, 26.5	26.5, 27.5	25.0, 27.5		
Water Temp. (C)	22.0, 24.5	24.5, 25.0	22.0, 25.0	25.0, 25.5	22.0, 25.0	25.0, 25.5	22.0, 24.5	24.5, 25.5		
Dissolved Oxygen (ppm)	6.9, 8.0	7.7, 8.0	7.8, 7.9	7.9, 8.0	7.4, 7.7	7.7, 7.9	7.6	7.6, 7.9		
pH	7.7, 7.8	7.8, 8.0	7.7, 8.0	8.0	7.7, 8.0	8.0	7.7, 7.9	7.8, 7.9		
Secchi Disc (cm)	25, 36	36, 38	25, 28	25, 36	23, 25	23, 38	25, [illegible]	30, 38		
River Stage (ft)	4.32, 4.51	4.20, 4.32	4.32, 4.51	4.20, 4.32	4.32, 4.51	4.20, 4.32	4.32, 4.51	4.20, 4.32		
Weather	Clear, Partly Cloudy	Partly Cloudy, Overcast	Clear, Partly Cloudy	Partly Cloudy, Overcast	Clear, Partly Cloudy	Partly Cloudy, Overcast	Clear, Partly Cloudy	Partly Cloudy, Overcast		
No. of Spec.	6	1	5	4	1	2	18	14	56	
No. of Typ	3	1	4	2	1	2	[illegible]	7	15	
Carp	-	-	-	-	1	-	1	-	2	3.4
Golden shiner	-	-	1	-	-	1	1	-	3	5.2
Spottail shiner	-	-	-	-	-	-	-	1	1	1.7
Spotfin shiner	-	-	-	-	-	1	-	-	1	1.7
Quillback	-	-	-	-	-	-	1	-	1	1.7
White catfish	-	-	-	-	-	-	1	-	1	1.7
Brown bullhead	3	-	-	-	-	-	2	1	6	10.3
Channel catfish	-	-	1	2	-	-	3	3	9	15.5
Margined madtom	-	-	-	-	1	-	-	-	1	1.7
Rock bass	-	-	1	2	-	-	-	-	3	5.2
Pumpkinseed	2	1	2	-	-	-	1	4	12	20.7
Bluegill	1	-	-	-	-	-	-	1	2	3.4
Black crappie	-	-	-	-	1	-	7	6	14	24.1
Yellow perch	-	-	-	-	-	-	1	1	2	3.4

POOR ORIGINAL

1565 075

Table 2.2-12

Lakes taken by trapnet on [illegible] in the vicinity of [illegible].

POOR ORIGINAL

1565 076

Table 2.2-13

Fishes taken by trapnet on 16-18 August 1976 in the vicinity of DRESDEN

Station	TRAP-1A1		TRAP-1A2		TRAP-2A1		TRAP-2A2		Total	Catch
Date	16-17	17-18	16-17	17-18	16-17	17-18	16-17	17-18		
Time	1423-1508	1413-1435	1403-1346	1349-1413	1341-1341	1343-1506	1314-1313	1316-1337		
Air Temp. (C)	22.5, 24.5	24.5, 29.5	22.5, 24.0	24.0, 26.5	22.0, 23.5	23.5, 26.0	22.5, 24.0	24.0, 27.0		
Water Temp. (C)	20.5, 21.5	20.5, 22.0	20.5, 21.5	20.5, 21.5	20.5, 21.0	20.5, 22.0	20.5, 21.5	20.5, 22.5		
Dissolved Oxygen (ppm)	7.5, 8.7	7.5, 8.1	7.5, 7.9	7.5, 8.3	7.6, 8.2	7.6, 8.1	7.8, 8.2	8.1, 8.2		
pH	8.0	8.0, 8.2	8.0	8.0, 8.1	8.0	8.0, 8.2	8.0, 8.1	8.0, 8.2		
Secchi Disc (cm)	18, 28	18, 33	20, 28	20, 28	20, 30	20, 25	15, 28	15, 33		
River Stage (ft)	4.48, 4.52	4.46, 4.48	4.48, 4.52	4.46, 4.48	4.48, 4.52	4.46, 4.48	4.48, 4.52	4.46, 4.48		
Weather	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear		
No. of Spec.	3	6	7	4	1	-	4	25		
No. of Sp.	3	6	5	4	1	1	2	10		
Carp	-	-	-	-	1	-	-	1	4.9	
Gafftopsail	1	1	1	-	-	-	-	1	4.9	
White sucker	1	-	1	1	SAME	-	SAME	3	17.9	
Channel catfish	-	1	1	-		-		1	12.0	
Rock Bass	-	1	1	-		-		2	8.0	
Redbreast sunfish	-	1	1	1	FISH	-	FISH	2	8.0	
Pumpkinseed	1	1	2	1		-		3	12.0	
Bluegill	-	-	-	1		-		5	20.0	
Black crappie	-	1	-	-	TAKEN	-	TAKEN	1	4.0	
Yellow perch	-	-	-	-		-		1	4.0	

Table 2.2-14

Fishes taken by trapnet on 1-3 September 1976 in the vicinity of DRESDEN

Station	TRAP-1A1		TRAP-1A2		TRAP-2A1		TRAP-2A2		Total	Catch
Date	1-2	2-3	1-2	2-3	1-2	2-3	1-2	2-3		
Time	1033-1004	1010-1026	1013-0938	0938-1001	1005-0931	0935-0955	0924-0902	0904-0922		
Air Temp. (C)	18.0, 21.5	15.0, 18.0	18.0, 19.0	16.0, 18.0	17.5, 20.0	15.5, 17.5	19.5, 20.5	15.5, 19.5		
Water Temp. (C)	20.5	18.5, 20.5	20.5, 21.0	19.0, 21.0	20.5, 21.0	19.0, 21.0	21.5	19.5, 21.5		
Dissolved Oxygen (ppm)	7.6, 7.9	7.6	7.1, 7.5	7.5, 7.8	7.2, 7.8	7.7, 7.8	7.7, 7.9	7.9, 8.0		
pH	8.3, 8.4	8.4, 8.5	8.3, 8.6	8.3, 8.5	8.3, 8.6	8.3, 8.5	8.3, 8.5	8.3, 8.4		
Secchi Disc (cm)	25, 30	28, 30	36, 43	28, 43	43, 43	33, 38	33, 38	33, 38		
River Stage (ft)	3.69, 3.71	3.69	3.69, 3.71	3.69	3.69, 3.71	3.69	3.69, 3.71	3.69		
Weather	Partly Cloudy, Overcast	Partly Cloudy, Overcast	Partly Cloudy, Overcast	Partly Cloudy, Overcast	Partly Cloudy	Partly Cloudy, Overcast	Partly Cloudy, Overcast	Overcast		
No. of Spec.	15	8	4	1	1	-	5	-	34	
No. of Sp.	9	1	4	1	1	1	2	-	19	
Gafftopsail	-	-	-	-	-	-	1	-	1	2.8
White catfish	1	-	-	-	-	-	-	-	1	2.8
Yellow bullhead	1	-	-	-	-	SAME	-	SAME	1	2.8
Channel catfish	6	2	1	-	-		-		9	25.9
Rock bass	-	2	1	1	1		-		5	13.9
Pumpkinseed	3	4	-	-	-	FISH	-	FISH	7	19.4
Bluegill	-	-	1	1	-		-		2	5.5
White crappie	-	-	-	1	-		-		1	2.8
Black crappie	2	-	1	-	-	TAKEN	4	TAKEN	7	19.4
Walleye	1	-	-	-	-		-		2	5.5

POOR ORIGINAL

1565 077

POOR ORIGINAL

1565 078

Table 2.2-16

Fishes taken by trapnet on 27-29 September 1976 in the vicinity of [illegible]

Species	[illegible]		[illegible]		[illegible]		[illegible]		Total	Catch
Date	27-28	28-29	27-28	28-29	27-28	28-29	27-28	28-29		
Time	0912-0917	0922-0918	0934-0937	0939-0943	1002-1008	1010-0948	1043-1043	1053-1019		
Air Temp. (C)	14.5, 18.5	9.5, 14.5	14.5, 19.0	11.5, 14.5	14.5, 19.0	12.5, 14.5	16.5, 19.0	15.0, 19.5		
Water Temp. (C)	15.0, 17.0	14.0, 15.0	15.0, 18.0	14.5, 15.0	15.5, 17.0	14.5, 15.5	16.0, 17.0	15.0, 16.0		
Dissolved Oxygen (ppm)	7.0, 7.4	7.0, 9.4	6.4, 7.6	6.4, 10.-	6.8, 7.4	6.8, 10.0	7.6, 7.8	7.6, 10.0		
pH	8.0, 8.1	8.0	8.0, 8.1	8.0	8.0, 8.1	8.0	8.0	7.9, 8.0		
Secchi Disc (cm)	30, 36	30	30, 36	3+	33, 36	30, 33	28, 36	28, 30		
River Stage (ft)	3.61, 3.72	3.72, 3.85	3.61, 3.72	3.72, 3.85	3.61, 3.72	3.72, 3.85	3.61, 3.72	3.72, 3.85		
Weather	Light Rain, Clear	Clear, Clear	Light Rain, Clear	Clear	Light Rain, Clear	Clear	Overcast, Clear	Clear		
No. of Species	8	10	7	7	-	1	12	15	18	11
No. of Fish	9	5	9	7	-	1	8	6	45	11
Golden shiner	-	-	1	-		-	1	1	5	3
Goldfish	-	-	-	-		-	1	1	2	1
Yellow bullhead	-	1	-	-		-	-	-	1	1
Brown bullhead	-		-			-	1		1	1
Channel catfish	-		-			-	-		-	1
Black bass	1	1	1			-	2	2	7	3
Redbreast sunfish	-	2	2			-	-	-	4	2
Bluegill	6	1		1		1	3	4	15	3
Longnose gar	-	-		-		-	-	-	-	1
Bluegill	-	-	1	-		-	1	-	2	1
White crappie	-	-	-	-		-	-	-	-	1
Black crappie	1	1	2	1		-	1	2	8	3

POOR ORIGINAL

1565 079

Table 2.2-17

Fishes taken by trapnet on 18-20 October 1976 in the vicinity of TMIN-

Station	TM AQ-151		TM AQ-152		TM AQ-153		TM AQ-154		Total	% catch
Date	18-19	19-20	18-19	19-20	18-19	19-20	18-19	19-20		
Time	1045-1115	1121-1037	1006-1045	1052-1011	0951-1038	1052-1004	0920-1009	1115-0931		
Air Temp. (C)	6.0, 6.5	6.0, 8.0	5.5, 6.5	6.5, 7.0	4.5, 6.0	6.0, 7.0	5.5, 6.0	5.5, 6.5		
Water Temp. (C)	9.0, 10.0	8.5, 10.0	9.0, 10.0	9.0, 10.0	9.0, 10.0	8.5, 10.0	9.5, 10.0	8.5, 10.0		
Dissolved Oxygen (ppm)	11.7, 13.0	12.4, 13.0	11.8, 12.8	12.4, 12.6	12.0, 12.4	12.6, 12.9	12.0, 13.0	12.3, 13.0		
pH	7.8, 8.0	8.0, 8.1	7.8, 8.1	8.0, 8.1	7.8, 8.1	8.0, 8.1	7.8, 8.0	8.1		
Secchi Disc (cm)	33, 36	38	33, 36	23, 33	30, 36	28, 30	33, 38	28, [illegible]		
River stage (ft)	5.34, 5.36	5.30, 5.34	5.34, 5.36	5.30, 5.34	5.34, 5.36	5.30, 5.34	5.35, 5.36	5.30, 5.34		
Weather	Partly cloudy	Partly cloudy, Heavy Rain	Partly cloudy	Partly cloudy, Heavy Rain	Partly cloudy	Clear, Heavy Rain	Partly cloudy	Clear, Heavy Rain		
No. of species	2	2	4	2		1	1	4	15	
No. of ind.	2	2	1	1		1	1	3	5	
Carp	-	-	-	-	NO	-	-	-	-	0.0
Channel catfish	8	2	9	2		1	-		25	71.4
Rock bass	1	5	-	-	FISH	-	-	-	6	17.1
Bluegill	-	-	-	-		-	1	-	1	2.9
Walleye	-	-	-	-	TAKEN	-	-	1	1	2.9

Table 2.2-18

Fishes taken by trapnet on 25-27 October 1976 in the vicinity of TMIN-

Station	TM AQ-151		TM AQ-152		TM AQ-153		TM AQ-154		Total	% catch
Date	25-26	26-27	25-26	26-27	25-26	26-27	25-26	26-27		
Time	1400-1320	1324-1330	1430-1402	1409-1402	1430-1429	1426-1422	1511-1505	1510-1500		
Air Temp. (C)	5.0, 9.0	2.5, 5.0	6.0, 10.0	5.0, 6.0	6.0, 9.5	5.0, 6.0	7.0, 11.0	5.5, 7.0		
Water Temp. (C)	6.5, 7.0	5.5, 6.5	7.0, 7.5	6.0, 7.0	7.0	5.5, 7.0	6.0, 7.5	5.5, 6.0		
Dissolved Oxygen (ppm)	12.0, 12.7	12.0, 13.6	12.2	12.2, 13.6	12.1, 12.6	12.1, 13.6	12.3, 13.1	13.1, 13.4		
pH	7.9, 8.3	7.9, 8.5	8.0, 8.3	8.0, 8.4	8.2, 8.3	8.2, 8.4	8.3	8.3		
Secchi Disc (cm)	33, 20	20, 30	33, 20	20, 30	33, 20	20, 30	33, 20	20, 33		
River stage (ft)	7.64, 7.94	7.66, 8.14	7.65, 7.94	7.66, 8.14	7.64, 7.94	7.65, 8.15	7.64, 7.94	7.65, 8.14		
Weather	Fog, Overcast	Overcast, Partly cloudy	Fog, Overcast	Overcast, Partly cloudy	Fog, Overcast	Overcast, Partly cloudy	Fog, Partly cloudy	Overcast		
No. of species	-	-	6	4			1	1	11	
No. of ind.	-	-	1	3			1	1	6	
Spottail shiner	NO FISH TAKEN		-	1	NO FISH TAKEN		-		1	7.1
Channel catfish			6	2			-	1	11	78.6
Margined madtom			-	-			1	-	1	7.1
Black crappie			-	1			-	-	1	7.1

POOR ORIGINAL

1565 080

POOR ORIGINAL

Table 2.2-19

Summary of fishes taken at trapnet station TM-AQF-1A3 during 1976.

Month	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Total	% Catch
Carp	1	-	1	2	-	1	2	-	7	2.4
Golden shiner	-	-	-	-	1	-	-	-	1	0.3
Spottail shiner	6	-	1	-	-	-	-	-	7	2.4
Quillback	-	-	-	-	3	2	-	-	5	1.7
White sucker	2	-	-	1	-	1	1	-	5	1.7
Northern hog sucker	2	1	-	-	-	-	-	-	3	1.0
Shorthead redhorse	1	-	-	-	-		-	-	1	0.3
White catfish	-	1	-	-	-	-	1	-	2	0.7
Yellow bullhead	-	-	-	-	-	-	2	-	2	0.7
Brown bullhead	1	2	3	1	4	2	-	-	13	4.4
Channel catfish	23	3	4	3	1	10	8	10	62	21.0
Margined madtom	1	-	1	-	-	-	-	-	2	0.7
Rock bass	-	7	8	7	-	7	5	6	40	13.6
Redbreast sunfish	-	3	11	3	1	4	2	-	24	8.1
Pumpkinseed	1	15	18	11	11	18	29	-	103	34.9
Bluegill	-	-	1	-	1	-	-	-	2	0.7
White crappie	2	-	-	-	-	-	-	-	2	0.7
Black crappie	-	-	-	-	-	1	11	-	12	4.1
Walleye	-	-	-	-	-	-	2	-	2	0.7
No. of Spcn.	40	32	48	28	22	46	83	16	295	
No. of Spp.	10	7	9	7	7	9	10	2	19	
No. of Coll.	6	4	4	4	4	4	6	4	36	
n/Coll.	6.67	8.00	12.00	7.00	5.50	11.50	10.50	4.00	8.19	
Diversity Index	2.18	2.19	2.46	2.34	2.15	2.48	2.44	0.95	2.95	

Table 2.2-20

Summary of fishes taken at trapnet station TM-AQF-11A2 during 1976.

Month	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Total	% Catch
Muskellunge	-	-	-	-	-	-	1	-	1	0.5
Carp	-	-	-	-	-	1	-	-	1	0.5
Golden shiner	-	-	-	-	1	2	1	-	4	2.2
Spottail shiner	-	6	-	-	-	-	-	1	7	3.8
Spotfin shiner	-	-	6	-	-	-	-	-	6	3.2
Quillback	-	-	-	-	-	1	-	-	1	0.5
White sucker	-	-	-	-	-	2	-	-	2	1.1
Shorthead redhorse	1	-	-	1	-	-	-	-	2	1.1
Brown bullhead	-	-	-	3	-	-	-	-	3	1.6
Channel catfish	3	7	-	4	3	7	1	21	46	24.9
Margined madtom	-	-	-	1	-	-	-	-	1	0.5
Rock bass	-	7	2	5	6	1	7	-	28	15.1
Redbreast sunfish	-	2	4	-	-	3	7	-	16	8.6
Pumpkinseed	-	-	4	7	9	4	4	-	28	15.1
Bluegill	-	-	-	-	2	2	7	-	11	5.9
Smallmouth bass	-	-	-	1	-	-	-	-	1	0.5
Largemouth bass	-	-	-	-	1	-	-	-	1	0.5
White crappie	1	-	-	1	-	1	1	-	4	2.2
Black crappie	-	-	-	6	2	5	6	1	20	10.8
Walleye	-	-	-	1	-	1	-	-	2	1.1
No. of Spcn.	5	22	16	30	24	30	35	23	185	
No. of Spp.	3	4	4	10	7	12	9	3	20	
No. of Coll.	6	4	4	4	4	4	6	4	36	
n/Coll.	0.83	5.50	4.00	7.50	6.00	7.50	5.83	5.75	5.14	
Diversity Index	1.37	1.88	1.91	2.92	2.39	3.24	2.77	0.51	3.35	

1565 081

POOR ORIGINAL

Table 2.2-21

Summary of fishes taken at trapnet station TM-AQF-11A3 during 1976.

Month	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Total	Catch
Carp	-	1	-	-	2	1	-	-	4	5.3
Golden shiner	-	-	-	-	1	1	-	-	2	2.7
Spottin shiner	-	-	-	-	1	-	-	-	1	1.3
Quillback	-	-	-	-	-	-	1	-	1	1.3
White sucker	-	-	1	1	-	-	-	-	2	2.7
Brown bullhead	-	-	-	2	-	-	-	-	2	2.7
Channel catfish	1	2	-	2	-	-	-	1	6	8.0
Margined madtom	2	-	-	1	1	-	-	-	4	5.3
Rock bass	2	1	3	5	1	-	1	-	13	17.3
Redbreast sunfish	1	1	12	4	1	1	2	-	22	29.3
Pumpkinseed	-	-	1	-	3	-	7	-	11	14.7
Bluegill	1	-	-	-	1	-	-	-	2	2.7
Smallmouth bass	-	-	1	-	-	-	-	-	1	1.3
Black crappie	-	-	-	2	2	-	-	-	4	5.3
No. of Spmn.	7	5	18	17	13	3	11	1	75	
No. of Spp.	5	4	5	7	9	3	4	1	14	
No. of Coll.	6	4	4	4	4	4	6	4	36	
n/Coll.	1.17	1.25	4.50	4.25	3.25	0.75	1.83	0.25	2.08	
Diversity Index	2.24	1.92	1.52	2.58	3.03	1.59	1.49	0.00	3.14	

Table 2.2-22

Summary of fishes taken at trapnet station TM-AQF-9B2 during 1976.

Month	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Total	Catch
Alewife	-	-	-	-	-	-	2	-	2	0.7
Carp	-	-	-	-	1	-	3	2	6	2.2
Golden shiner	-	-	-	-	2	-	9	-	11	4.1
Spottail shiner	-	-	-	-	1	-	-	-	1	0.4
Quillback	-	-	1	1	1	2	7	-	12	4.5
White catfish	1	-	-	-	1	-	-	-	2	0.7
Yellow bullhead	-	-	2	-	-	-	-	-	2	0.7
Brown bullhead	2	6	1	5	5	1	3	-	23	8.6
Channel catfish	5	7	5	2	9	-	3	4	35	13.1
Margined madtom	-	-	-	-	-	-	-	1	1	0.4
Rock bass	1	2	4	1	1	-	6	-	15	5.6
Redbreast sunfish	-	2	7	-	-	-	-	-	9	3.4
Pumpkinseed	4	12	31	3	10	4	8	-	72	27.0
Bluegill	-	-	2	-	1	3	1	1	8	3.0
Smallmouth bass	1	-	-	-	-	-	-	-	1	0.4
White crappie	-	-	1	-	1	-	12	-	14	5.2
Black crappie	2	-	5	5	17	5	13	-	47	17.6
Yellow perch	-	-	-	-	2	1	-	-	3	1.1
Walleye	1	-	-	-	-	-	1	1	3	1.1
No. of Spmn.	17	29	59	17	52	16	68	9	267	
No. of Spp.	8	5	10	6	13	6	12	5	19	
No. of Coll.	6	4	4	4	4	4	6	4	36	
n/Coll.	2.83	7.25	14.75	4.25	13.00	4.00	11.33	2.25	7.42	
Diversity Index	2.70	2.02	2.35	2.32	2.88	2.35	3.22	2.06	3.32	

1565 082

Table 2.2-23

Summary of fishes taken at trapnet stations during March through October 1976.

Station	TH-AQF-1A3	TH-AQF-11A2	TH-AQF-11A3	TH-AQF-2B2	Total	% Catch
Alewife	-	-	-	2	2	0.2
Muskellunge	-	1	-	-	1	0.1
Carp	7	1	4	6	18	2.2
Golden shiner	1	4	2	11	18	2.2
Spottail shiner	7	7	-	1	15	1.8
Spotfin shiner	-	6	1	-	7	0.9
Quillback	5	1	1	12	19	2.3
White sucker	5	2	2	-	9	1.1
Northern hog sucker	3	-	-	-	3	0.4
Shorthead redhorse	1	2	-	-	3	0.4
White catfish	2	-	-	2	4	0.5
Yellow bullhead	2	-	-	2	4	0.5
Brown bullhead	13	3	2	23	41	5.0
Channel catfish	62	46	6	35	149	18.1
Margined madtom	2	1	4	1	8	1.0
Rock bass	40	28	13	15	96	11.7
Redbreast sunfish	24	16	22	9	71	8.6
Pumpkinseed	103	28	11	72	214	26.0
Bluegill	2	11	2	8	23	2.8
Smallmouth bass	-	1	1	1	3	0.4
Largemouth bass	-	1	-	-	1	0.1
White crappie	2	4	-	14	20	2.4
Black crappie	12	20	4	47	83	10.1
Yellow perch	-	-	-	3	3	0.4
Walleye	2	2	-	3	7	0.9
No. of Spmn.	295	185	75	267	822	
No. of Spp.	19	20	14	19	25	
No. of Coll.	36	36	36	36	144	
Diversity Index	2.95	3.35	3.14	3.32	3.41	

POOR ORIGINAL

1565 083

Table 2.2-24

Monthly abundance of fishes taken at trapnet stations upstream (U) and downstream (D) from the Discharge during March through October 1976.

Month	March		April		May		June		July		August		September		October		Total Catch		Total Catch		TOTAL CATCH	
	U	D	U	D	U	D	U	D	U	D	U	D	U	D	U	D	U	D	U	D	U	D
Alewife	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	2	0.4	2	0.2
Skipjack	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	0.2	1	0.1
Carp	1	-	-	1	1	-	2	-	-	3	1	2	2	3	-	2	7	2.4	11	2.1	18	2.2
Golden shiner	-	-	-	-	-	-	-	-	1	4	-	1	-	10	-	-	1	0.3	17	3.2	18	2.2
Spottail shiner	6	-	-	6	1	-	-	-	-	1	-	-	-	-	-	1	7	2.4	8	1.5	15	1.8
Spotfin shiner	-	-	-	-	-	6	-	-	-	1	-	-	-	-	-	-	-	-	7	1.3	7	0.9
Gulfback	-	-	-	-	-	1	-	1	3	1	2	3	-	8	-	-	5	1.7	14	2.7	19	2.3
White sucker	2	-	-	-	-	1	1	1	-	-	1	2	1	-	-	-	5	1.7	4	0.8	9	1.1
Northern hog sucker	2	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	3	1.0	-	-	3	0.4
Shorthead redhorse	1	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	0.3	2	0.4	3	0.4
White catfish	-	1	1	-	-	-	-	-	-	1	-	-	1	-	-	-	2	0.7	2	0.4	4	0.5
Yellow bullhead	-	-	-	-	-	2	-	-	-	-	-	-	2	-	-	-	2	0.7	2	0.4	4	0.5
Brown bullhead	1	2	2	6	3	1	1	10	4	5	1	1	-	3	-	-	11	3.4	28	5.1	41	5.0
Channel catfish	21	9	3	16	4	5	3	8	1	12	10	7	8	4	10	26	62	21.0	87	16.5	149	18.1
Striped mullet	1	2	-	-	1	-	-	2	-	1	-	-	-	-	-	1	2	0.7	4	1.1	6	1.0
Rock bass	-	1	2	10	8	9	7	11	-	8	7	1	5	14	6	-	40	13.6	56	10.6	96	11.7
Redbreast sunfish	-	1	3	5	11	23	3	4	1	1	4	4	2	9	-	-	24	8.1	47	8.9	71	8.6
Pumpkinseed	1	4	15	12	18	16	11	10	11	22	18	8	29	19	-	-	101	34.9	111	21.1	212	25.8
Bluegill	-	1	-	-	1	2	-	-	1	5	-	5	-	8	-	1	2	0.7	21	4.0	23	2.8
Smallmouth bass	-	1	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	3	0.6	3	0.4
Largemouth bass	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	0.2	1	0.1
White crappie	2	1	-	-	-	1	-	1	-	1	-	1	-	13	-	-	2	0.7	18	3.4	20	2.4
Black crappie	-	2	-	-	-	5	-	13	-	21	1	10	11	14	-	1	12	4.1	71	13.5	83	10.1
Yellow perch	-	-	-	-	-	-	-	-	-	2	-	1	-	-	-	-	-	-	3	0.6	3	0.4
Walleye	-	1	-	-	-	-	-	1	-	-	-	1	2	1	-	1	2	0.7	5	0.9	7	0.9
No. of Spcs.	10	13	7	7	9	13	7	13	7	17	9	14	10	14	2	7	19		522		822	
No. of Ind.	6	18	4	12	4	12	4	12	4	12	4	12	6	18	4	12	36		108		144	
n/Ind.	6.67	1.61	8.00	4.67	12.00	7.75	7.00	5.33	5.50	2.42	11.50	4.08	10.50	6.33	4.00	2.75	8.19		4.88		5.71	
Monthly Total	69		88		141		92		111		95		177		69							
S/Ind.	2.88		5.50		8.81		5.75		6.95		5.96		7.38		3.06							

POOR ORIGINAL

1565 084

Table 2.2-25

Indices of percent similarity of species composition between trapnet stations during 1974, 1975, and 1976.

	1974						1975	
			82.5	11A2	38.7			
		70.9	65.1	11A3	64.8	45.5		
	57.2	73.0	66.4	9B2	67.1	46.9	63.8	
	11A3	11A2	1A3		1A3	11A2	11A3	
	49.4	60.3	56.1	9B2				
		62.6	58.3	11A3				
			71.2	11A2				
	1976							

POOR ORIGINAL

Table 2.2-26

Indices of percent similarity of species composition between seine stations during 1974, 1975, and 1976.

1974			84.0	16A1	44.7			1975
		88.9	77.0	10A2	61.0	70.3		
	71.1	71.3	64.1	9A1	71.0	37.8	44.4	
84.4	72.9	69.7	60.1	9B3	56.5	73.3	83.2	45.9
9A1	10A2	16A1	1A2		1A2	16A1	10A2	9A1
79.3	77.9	67.3	71.4	9B3				
	82.0	79.4	68.2	9A1				
		70.5	80.9	10A2				
1976			64.4	16A1				

1565 085

Table 2.2-27

Fishes taken by seine on 2 March 1976 in the vicinity of TMINS.

Station	TM-3OE-1A2	TM-3OE-16A1	TM-3OE-1OA2	TM-3OE-9A1	TM-3OE-4B3	Total	% Catch
Time	1010	1030	1045	1115	1135		
Air Temp. (C)	6.0	6.0	5.5	6.0	5.0		
Water Temp. (C)	6.5	6.5	6.5	6.5	6.5		
Dissolved Oxygen (ppm)	8.8	9.0	9.7	9.3	8.6		
pH	8.0	8.1	8.1	8.0	7.9		
Secchi Disc (cm)	51	51	41	36	51		
River Stage (ft)	6.80	6.80	6.80	6.80	6.80		
Weather	Fog	Fog	Fog	Fog	Fog		
No. of Spcm.	11	16	7	3	44	81	
No. of Spp.	2	6	3	2	6	10	
Comely shiner	-	3	-	-	-	3	3.7
Common shiner	-	-	-	-	1	1	1.2
Spottail shiner	-	2	-	-	1	3	3.7
Swallowtail shiner	-	1	-	1	7	9	11.1
Spotfin shiner	5	8	5	-	33	51	63.0
Bluntnose minnow	3	-	1	-	1	5	6.2
Blacknose dace	-	1	-	-	-	1	1.2
Redbreast sunfish	-	1	-	-	1	2	2.5
Tessellated darter	-	-	1	2	-	3	3.7
Banded darter	3	-	-	-	-	3	3.7

POOR ORIGINAL

Table 2.2-28

Fishes taken by seine on 15 March 1976 in the vicinity of TMINS.

Station	TM-3OE-1A2	TM-3OE-16A1	TM-3OE-1OA2	TM-3OE-9A1	TM-3OE-4B3	Total	% Catch
Time	1030	1045	1100	1130	1200		
Air Temp. (C)	11.0	12.0	13.0	13.0	11.5		
Water Temp. (C)	6.0	5.5	6.0	6.0	6.0		
Dissolved Oxygen (ppm)	10.8	10.8	10.0	9.8	9.5		
pH	7.8	7.7	7.6	7.8	7.8		
Secchi Disc (cm)	61	61	43	61	64		
River Stage (ft)	5.84	5.84	5.84	5.84	5.84		
Weather	Clear	Clear	Clear	Clear	Partly Cloudy		
No. of Spcm.	24	24	32	31	-	111	
No. of Spp.	3	4	3	4	-	9	
Comely shiner	-	2	-	-		2	1.8
Spottail shiner	-	-	4	1		5	4.5
Swallowtail shiner	3	3	2	2	NO	10	9.0
Emeyface shiner	-	-	4	-		4	3.6
Spotfin shiner	15	18	14	26		73	65.8
Bluntnose minnow	6	-	4	2	FISH	12	10.8
Fathead minnow	-	1	-	-		1	0.9
Redbreast sunfish	-	-	2	-		2	1.8
Tessellated darter	-	-	1	-	TAKEN	2	1.8

1565 086

Table 2.2-29

Fishes taken by seine on 29 March 1976 in the vicinity of TMIN.

Station	TM-AQF-1A2	TM-AQF-1&1	TM-AQF-1CA2	TM-AQF-9A1	TM-AQF-9B3	Total	[illegible]
Time	1020	1040	1055	1135	1140		
Air Temp. (C)	12.0	12.0	12.0	13.0	13.0		
Water Temp. (C)	10.5	10.5	10.0	10.5	10.5		
Dissolved Oxygen (ppm)	8.8	9.2	9.7	9.1	8.5		
pH	7.9	7.9	7.9	7.8	7.8		
Secchi Disc (cm)	33	41	41	36	46		
River Stage (ft)	5.52	5.52	5.52	5.52	5.52		
Weather	Overcast	Overcast	Overcast	Overcast	Overcast		
No. of Spmn.	13	16	30	4	13	76	
No. of Spp.	3	4	4	2	3	9	
Spottail shiner	-	1	21	-	-	22	28.9
Swallowtail shiner	-	-	1	-	6	7	9.3
Spotfin shiner	8	1	13	-	6	28	36.8
Bluntnose minnow	-	4	8	1	-	13	17.1
Blacknose dace	1	-	-	-	-	1	1.3
Creek chub	-	-	1	-	-	1	1.3
Channel catfish	-	-	1	-	-	1	1.3
Tessellated darter	4	10	2	3	1	20	26.3
Banded darter	-	-	3	-	-	3	3.9

POOR ORIGINAL

Table 2.2-30

Fishes taken by seine on 13 April 1976 in the vicinity of TMINS.

Station	TM-AQF-1A2	TM-AQF-1&1	TM-AQF-1CA2	TM-AQF-9A1	TM-AQF-9B3	Total	[illegible]
Time	0922	0935	0945	1020	1030		
Air Temp. (C)	9.5	10.0	10.5	10.0	11.5		
Water Temp. (C)	7.0	8.0	8.0	8.0	8.0		
Dissolved Oxygen (ppm)	10.7	10.8	11.0	10.5	10.4		
pH	7.7	7.6	7.7	7.7	7.7		
Secchi Disc (cm)	NA	122	137	137	137		
River Stage (ft)	4.83	4.83	4.83	4.83	4.83		
Weather	Partly Cloudy	Partly Cloudy	Partly Cloudy	Partly Cloudy	Partly Cloudy		
No. of Spmn.	1	6	35	1	5	48	
No. of Spp.	1	3	6	1	3	8	
Spottail shiner	-	-	18	-	2	20	41.7
Swallowtail shiner	-	1	1	-	1	3	6.3
Rosyface shiner	1	-	-	-	-	1	2.1
Spotfin shiner	-	4	11	-	2	17	35.4
Bluntnose minnow	-	-	2	-	-	2	4.2
Pumpkinseed	-	-	-	1	-	1	2.1
Tessellated darter	-	1	2	-	-	3	6.3
Banded darter	-	-	1	-	-	1	2.1

1565 087

Table 2.2-31

Fishes taken by seine on 30 April 1976 in the vicinity of TMINS.

Station	TM-AQF-1A2	TM-AQF-14A1	TM-AQF-10A2	TM-AQF-9A1	TM-AQF-9B3	Total	Catch
Time	1450	1440	1422	1400	1350		
Air Temp. (C)	20.0	20.5	20.5	19.0	19.0		
Water Temp. (C)	15.0	15.0	14.0	14.5	14.5		
Dissolved Oxygen (ppm)	10.0	9.9	9.7	10.6	10.2		
pH	7.5	7.5	7.6	7.9	8.0		
Secchi Disc (cm)	61	38	48	61	64		
River Stage (ft)	5.28	5.28	5.28	5.28	5.28		
Weather	Clear	Clear	Clear	Clear	Clear		
No. of Spmn.	17	2	24	1	3	47	
No. of Spp.	3	2	5	1	1	6	
Spottail shiner	-	-	-	-	-	-	0.2
Swallowtail shiner	7	-	1	-	-	8	16.3
Spotfin shiner	6	1	19	1	3	30	61.2
Bluntnose minnow	-	-	1	-	-	1	2.0
Smallmouth bass	-	-	1	-	-	1	2.0
Tessellated darter	4	1	-	-	-	5	10.2

Table 2.2-32

Fishes taken by seine on 10 May 1976 in the vicinity of TMINS.

Station	TM-AQF-1A2	TM-AQF-14A1	TM-AQF-10A2	TM-AQF-9A1	TM-AQF-9B3	Total	Catch
Time	1035	1015	1000	0942	0930		
Air Temp. (C)	22.0	23.0	20.0	19.0	18.0		
Water Temp. (C)	16.5	16.0	16.0	15.5	16.0		
Dissolved Oxygen (ppm)	8.7	9.2	8.4	9.1	8.6		
pH	7.9	7.9	7.9	7.9	8.0		
Secchi Disc (cm)	107	107	107	107	107		
River Stage (ft)	4.51	4.51	4.51	4.51	4.51		
Weather	Clear	Clear	Clear	Clear	Clear		
No. of Spmn.	1	-	2	-	-	3	
No. of Spp.	1	-	2	-	-	2	
Bluntnose minnow	-	NO FISH TAKEN	1	NO FISH TAKEN		1	33.3
Tessellated darter	1		1			2	66.7

POOR ORIGINAL

Table 2.2-33

Fishes taken by seine on 24 May 1976 in the vicinity of TMINS.

Station	TM-AQF-1A2	TM-AQF-14A1	TM-AQF-10A2	TM-AQF-9A1	TM-AQF-9B3	Total	Catch
Time	1040	1025	1005	0943	0927		
Air Temp. (C)	16.5	16.0	15.0	15.0	15.0		
Water Temp. (C)	16.5	16.0	15.5	15.5	16.0		
Dissolved Oxygen (ppm)	NA	NA	NA	NA	NA		
pH	7.5	7.5	7.5	7.5	7.7		
Secchi Disc (cm)	33	41	41	51	56		
River Stage (ft)	5.83	5.83	5.83	5.83	5.83		
Weather	Clear	Clear	Clear	Clear	Clear		
No. of Spmn.	3	1	4	-	37	45	
No. of Spp.	3	1	2	-	5	7	
Spottail shiner	-	-	3		1	4	8.9
Swallowtail shiner	1	-	-	NO	-	1	2.2
Spotfin shiner	1	-	-		-	1	2.2
Creek chub	-	-	-	FISH	4	4	8.9
White sucker/Shorthead redhorse	-	-	-		30	30	66.7
Smallmouth bass	1	1	1	TAKEN	1	4	8.9
Tessellated darter	-	-	-		1	1	2.2

NA = Not Available

1565 088

Table 2.2-34

Fishes taken by seine on 7 June 1976 in the vicinity of TMINS.

Station	TM-AQF-1A2	TM-AQF-16A1	TM-AQF-10A2	TM-AQF-9A1	TM-AQF-9B3	Total	[illegible]
Time	1040	1030	1010	0945	0930		
Air Temp. (C)	22.5	22.0	22.5	21.5	21.5		
Water Temp. (C)	19.5	19.5	19.0	19.0	19.5		
Dissolved Oxygen (ppm)	8.2	7.9	8.7	7.9	8.2		
pH	8.2	8.1	7.9	8.0	8.1		
Secchi Disc (cm)	61	56	51	56	61		
River Stage (ft)	4.69	4.69	4.69	4.69	4.69		
Weather	Clear	Clear	Clear	Clear	Clear		
No. of Spmn.	79	685	219	333	876	2192	
No. of Spp.	7	4	9	6	4	11	
Spottail shiner	36	339	77	240	773	1465	[illegible]
Swallowtail shiner	2	-	-	-	-	2	[illegible]
Spotfin shiner	26	8	6	-	-	40	[illegible]
Bluntnose minnow	-	-	4	-	-	4	[illegible]
Longnose dace	1	-	2	-	7	10	[illegible]
Creek chub	-	-	1	4	12	17	[illegible]
White sucker/Shorthead redhorse	8	324	123	85	84	624	[illegible]
Redbreast sunfish	-	-	2	-	-	2	[illegible]
Bluegill	-	-	-	1	-	1	-
Tessellated darter	5	-	3	1	-	9	[illegible]
Shield darter	1	14	1	2	-	18	[illegible]

+ = less than 0.05%.

POOR ORIGINAL

Table 2.2-35

Fishes taken by seine on 21 June 1976 in the vicinity of TMINS.

Station	TM-AQF-1A2	TM-AQF-16A1	TM-AQF-10A2	TM-AQF-9A1	TM-AQF-9B3	Total	[illegible]
Time	1030	1015	1000	0932	0920		
Air Temp. (C)	25.5	26.0	25.0	24.5	24.5		
Water Temp. (C)	25.0	24.0	25.0	25.0	25.0		
Dissolved Oxygen (ppm)	7.8	6.4	7.0	6.5	6.1		
pH	8.7	8.1	8.3	8.5	8.2		
Secchi Disc (cm)	30	30	30	30	30		
River Stage (ft)	4.42	4.42	4.42	4.42	4.42		
Weather	Overcast	Overcast	Overcast	Overcast	Overcast		
No. of Spmn.	391	306	403	89	230	1419	
No. of Spp.	6	[illegible]	7	6	5	12	
Comely shiner	-	3	1	-	-	4	[illegible]
Spottail shiner	371	261	372	77	193	1274	[illegible]
Spotfin shiner	2	8	6	5	8	29	[illegible]
Blacknose dace	-	1	-	-	-	1	[illegible]
Longnose dace	-	1	-	-	-	1	[illegible]
Creek chub	-	2	8	2	12	24	[illegible]
White sucker	-	1	1	-	-	2	[illegible]
Shorthead redhorse	-	16	-	-	-	16	[illegible]
White sucker/Shorthead redhorse	4	-	10	3	16	33	[illegible]
Pumpkinseed	1	-	-	-	-	1	[illegible]
Smallmouth bass	1	-	-	1	-	2	[illegible]
Tessellated darter	12	11	5	1	1	30	[illegible]
Shield darter	-	2	-	-	-	2	[illegible]

1565 089

Table 2.2-36

Fishes taken by seine on 7 July 1976 in the vicinity of TMINS.

Station	TM-NOF-1A2	TM-NOF-1A1	TM-NOF-10A2	TM-NOF-10A1	TM-NOF-10B3	Total	%
Time	0935	1020	1040	1115	1130		
Air Temp. (C)	22.0	21.5	21.5	22.5	24.0		
Water Temp. (C)	24.0	24.5	24.5	24.5	25.0		
Dissolved Oxygen (ppm)	6.8	6.2	6.8	7.0	6.9		
pH	7.3	7.6	7.3	7.3	7.2		
Secchi Disc (cm)	36	30	30	33	30		
River Stage (ft)	4.46	4.46	4.46	4.46	4.46		
Weather	Overcast	Overcast	Overcast	Overcast	Overcast		
No. of Spmn.	636	445	179	89	359	1678	
No. of Spp.	7	10	9	7	8	17	
Comely shiner	-	23	-	-	-	23	1.4
Common shiner	1	-	-	-	-	1	0.1
Spottail shiner	595	355	150	61	200	1361	81.1
Spotfin shiner	31	3	1	1	-	36	2.1
Bluntnose minnow	-	2	1	-	-	3	0.2
Blacknose dace	1	-	-	-	-	1	0.1
Fallfish	-	1	4	8	3	16	1.0
White sucker	-	-	8	6	131	145	8.6
Northern hog sucker	-	1	-	-	-	1	0.1
Shorthead redhorse	-	-	-	-	1	1	0.1
White sucker/Shorthead redhorse	-	10	6	-	-	16	1.0
Brown bullhead	-	-	-	-	4	4	0.2
Channel catfish	-	-	5	-	7	12	0.7
Rock bass	1	-	-	-	-	1	0.1
Smallmouth bass	5	9	2	3	5	24	1.4
White crappie	-	-	-	3	-	3	0.2
Tessellated darter	2	9	2	7	8	28	1.7
Banded darter	-	2	-	-	-	2	0.1

Table 2.2-37

Fishes taken by seine on 19 July 1976 in the vicinity of TMINS.

Station	TM-NOF-1A2	TM-NOF-1A1	TM-NOF-10A2	TM-NOF-10A1	TM-NOF-10B3	Total	%
Time	1446	1355	1337	1308	1253		
Air Temp. (C)	24.5	29.0	25.5	27.5	27.0		
Water Temp. (C)	25.0	24.0	24.5	24.5	24.5		
Dissolved Oxygen (ppm)	7.4	7.2	7.4	7.4	7.2		
pH	7.8	7.8	7.8	7.7	7.6		
Secchi Disc (cm)	30	23	28	28	30		
River Stage (ft)	4.51	4.51	4.51	4.51	4.51		
Weather	Clear	Clear	Clear	Clear	Clear		
No. of Spmn.	218	164	124	73	30	679	
No. of Spp.	10	12	10	9	7	21	
Carp	-	-	1	-	-	1	0.2
Comely shiner	4	3	2	-	-	9	1.3
Common shiner	4	2	-	-	-	6	0.9
Spottail shiner	218	128	83	52	12	493	72.6
Spotfin shiner	47	3	2	3	-	55	8.1
Bluntnose minnow	2	-	-	2	1	5	0.7
Blacknose dace	1	-	-	-	-	1	0.1
Creek chub	-	-	1	-	-	1	0.1
Fallfish	-	3	-	1	-	4	0.6
Quillback	-	1	-	-	-	1	0.1
White sucker	4	3	2	6	5	20	2.9
Shorthead redhorse	1	6	23	4	2	36	5.3
Brown bullhead	-	-	-	-	3	3	0.4
Rock bass	-	1	-	-	-	1	0.1
Redbreast sunfish	-	-	-	1	-	1	0.1
Pumpkinseed	1	-	-	-	-	1	0.1
Smallmouth bass	6	3	3	1	1	14	2.1
Largemouth bass	-	1	-	-	-	1	0.1
White crappie	-	-	1	-	-	1	0.1
Tessellated darter	-	9	6	3	6	24	3.5
Banded darter	-	1	-	-	-	1	0.1

POOR ORIGINAL

1565 090

Table 2.2-38

Fishes taken by seine on 2 August 1976 in the vicinity of TMINS.

Station	TM-AQF-1A2	TM-AQF-16A1	TM-AQF-10A2	TM-AQF-9A1	TM-AQF-9B3	Total	% Catch
Time	1005	1028	1042	1108	1122		
Air Temp. (C)	20.0	19.5	20.5	20.0	20.5		
Water Temp. (C)	21.0	21.0	21.0	21.0	21.0		
Dissolved Oxygen (ppm)	8.0	7.8	8.2	8.0	7.9		
pH	8.5	8.4	8.1	8.1	8.0		
Secchi Disc (cm)	30	33	33	30	30		
River Stage (ft)	3.96	3.96	3.96	3.96	3.96		
Weather	Partly Cloudy	Partly Cloudy	Partly Cloudy	Partly Cloudy	Partly Cloudy		
No. of Spm.	48	125	99	61	271	570	
No. of Spp.	7	9	6	8	7	16	
Comely shiner	1	-	-	-	-	1	0.2
Common shiner	5	3	-	-	-	8	1.4
Spottail shiner	19	97	35	28	8	187	32.8
Spotfin shiner	1	-	-	-	-	1	0.2
Bluntnose minnow	-	7	2	3	-	12	2.1
Fallfish	1	2	-	-	-	3	0.5
White sucker	-	1	2	4	1	8	1.4
Northern hog sucker	-	-	-	1	-	1	0.2
Shorthead redhorse	-	4	6	4	-	14	2.5
Yellow bullhead	-	-	-	-	2	2	0.4
Brown bullhead	-	-	-	-	2	2	0.4
Channel catfish	-	-	-	3	256	259	45.4
Redbreast sunfish	-	1	-	-	-	1	0.2
Smallmouth bass	2	1	7	1	-	11	1.9
White crappie	-	-	-	-	1	1	0.2
Tessellated darter	19	9	13	17	1	59	10.4

POOR ORIGINAL

Table 2.2-39

Fishes taken by seine on 16 August 1976 in the vicinity of TMINS.

Station	TM-AQF-1A2	TM-AQF-16A1	TM-AQF-10A2	TM-AQF-9A1	TM-AQF-9B3	Total	% Catch
Time	1045	1000	0945	0920	0905		
Air Temp. (C)	18.5	18.5	18.5	18.0	18.0		
Water Temp. (C)	19.5	20.0	20.0	19.5	20.0		
Dissolved Oxygen (ppm)	7.4	7.2	7.3	7.5	7.8		
pH	8.0	8.2	8.0	8.3	8.4		
Secchi Disc (cm)	28	28	28	28	28		
River Stage (ft)	4.52	4.52	4.52	4.52	4.52		
Weather	Clear	Clear	Clear	Clear	Clear		
No. of Spm	32	124	108	51	104	419	
No. of Spp.	9	12	10	10	8	18	
River chub	1	-	1	-	-	2	0.5
Comely shiner	2	2	-	-	1	5	1.2
Common shiner	3	6	-	-	1	10	2.4
Spottail shiner	5	71	64	20	11	171	40.8
Swallowtail shiner	2	-	-	-	-	2	0.5
Spotfin shiner	12	23	3	5	12	55	13.1
Bluntnose minnow	5	3	1	1	23	33	7.9
Fallfish	-	-	1	1	-	2	0.5
White sucker	-	-	1	-	-	1	0.2
Shorthead redhorse	-	2	6	4	-	12	2.9
Rock bass	-	4	-	-	-	4	1.0
Redbreast sunfish	-	-	-	1	-	1	0.2
Pumpkinseed	-	-	1	-	-	1	0.2
Bluegill	-	1	-	2	-	3	0.7
Smallmouth bass	-	2	4	1	2	9	2.1
White crappie	-	1	-	4	18	23	5.5
Black crappie	1	1	-	-	-	2	0.5
Tessellated darter	1	8	26	12	36	83	19.8

1565 091

Table 2.2-40

Fishes taken by seine on 1 September 1976 in the vicinity of TMINS.

Station	TM-AQF-1A2	TM-AQF-1BA1	TM-AQF-1CA2	TM-AQF-4A1	TM-AQF-4B3	Total	% Catch
Time	1308	1355	1413	1445	1500		
Air Temp. (C)	24.0	26.0	25.5	26.5	25.5		
Water Temp. (C)	22.0	22.5	22.5	23.0	22.5		
Dissolved Oxygen (ppm)	8.3	8.1	7.6	7.7	8.0		
pH	8.5	8.5	8.4	8.5	8.5		
Secchi Disc (cm)	30	28	28	30	30		
River Stage (ft)	3.73	3.73	3.73	3.73	3.73		
Weather	Partly Cloudy	Partly Cloudy	Partly Cloudy	Partly Cloudy	Partly Cloudy		
No. of Spmn.	220	154	[illegible]	[illegible]	49	621	
No. of Spp.	8	12	11	7	4	20	
Cutlips minnow	-	-	1	-	-	1	0.2
River chub	-	-	1	-	-	1	0.2
Golden shiner	-	1	-	-	-	1	0.2
Comely shiner	-	1	2	-	-	3	0.5
Common shiner	-	7	-	-	-	7	1.1
Spottail shiner	13	104	24	12	3	156	25.1
Swallowtail shiner	8	-	-	-	-	8	1.3
Spotfin shiner	172	16	4	33	-	225	36.2
Bluntnose minnow	1	2	4	3	-	10	1.6
Creek chub	-	1	-	-	-	1	0.2
White sucker	-	4	1	1	-	6	1.0
Northern ho, sucker	2	-	-	-	-	2	0.3
Shorthead redhorse	2	-	1	3	-	6	1.0
White catfish	-	-	1	-	-	1	0.2
Channel catfish	-	-	58	28	41	127	20.5
Pumpkinseed	-	1	-	-	-	1	0.2
Bluegill	-	-	-	-	1	1	0.2
Smallmouth bass	1	3	-	-	-	4	0.6
Black crappie	-	4	-	-	-	4	0.6
Tessellated darter	21	10	7	14	4	56	9.0

POOR ORIGINAL

Table 2.2-41

Fishes taken by seine on 13 September 1976 in the vicinity of TMINS.

Station	TM-AQF-1A2	TM-AQF-1BA1	TM-AQF-1CA2	TM-AQF-4A1	TM-AQF-4B3	Total	% Catch
Time	1432	1345	1326	1253	1240		
Air Temp. (C)	27.5	28.5	26.0	26.0	25.0		
Water Temp. (C)	21.5	21.5	21.0	22.0	22.5		
Dissolved Oxygen (ppm)	7.6	7.7	7.5	7.6	7.8		
pH	8.5	8.4	8.4	8.6	8.7		
Secchi Disc (cm)	36	46	33	53	53		
River Stage (ft)	3.48	3.48	3.48	3.48	3.48		
Weather	Clear	Clear	Clear	Clear	Clear		
No. of Spmn.	114	54	59	21	77	325	
No. of Spp.	8	10	6	5	5	14	
Comely shiner	8	1	1	-	-	10	3.1
Common shiner	-	1	-	-	-	1	0.3
Spottail shiner	16	26	18	5	-	65	20.0
Spotfin shiner	49	-	19	-	1	69	[illegible]
Bluntnose minnow	13	3	3	-	-	19	[illegible]
Shorthead redhorse	-	2	-	-	-	2	0.6
Channel catfish	1	1	8	7	72	89	27.4
Rock bass	1	-	-	-	-	1	0.3
Redbreast sunfish	-	1	-	1	-	2	0.6
Pumpkinseed	-	-	-	-	1	1	0.3
Bluegill	-	1	-	-	1	2	0.6
Smallmouth bass	1	-	-	2	-	3	0.9
Tessellated darter	25	17	10	6	2	60	18.5
Banded darter	-	1	-	-	-	1	0.3

1565 092

Table 2.2-42

Fishes taken by seine on 29 September 1976 in the vicinity of TMINS.

Station	TM-AQF-1A2	TM-AQF-16A1	TM-AQF-10A2	TM-AQF-9A1	TM-AQF-9B3	Total	Catch
Time	1330	1415	1433	1506	1520		
Air Temp. (C)	19.5	20.0	19.5	18.5	20.0		
Water Temp. (C)	16.0	17.5	16.5	17.0	17.5		
Dissolved Oxygen (ppm)	9.6	10.0	9.8	9.8	10.0		
pH	8.3	8.2	8.1	8.1	8.1		
Secchi Disc (cm)	30	30	30	36	33		
River Stage (ft)	3.85	3.85	3.85	3.85	3.85		
Weather	Partly Cloudy	Partly Cloudy	Partly Cloudy	Partly Cloudy	Partly Cloudy		
No. of Spmn.	539	27	231	49	247	1104	
No. of Spp.	7	6	11	5	6	15	
Comely shiner	1	-	-	-	-	1	0.1
Spottail shiner	3	9	8	12	-	32	2.9
Swallowtail shiner	2	-	1	-	-	3	0.3
Spotfin shiner	510	-	178	-	221	909	82.3
Bluntnose minnow	2	1	10	6	-	19	1.7
Creek chub	-	1	-	-	-	1	0.1
Fallfish	-	-	2	-	-	2	0.2
Shorthead redhorse	-	-	1	-	1	2	0.2
Channel catfish	-	1	4	2	1	8	0.7
Redbreast sunfish	-	-	1	-	-	1	0.1
Pumpkinseed	-	-	-	-	1	1	0.1
Bluegill	-	-	1	-	-	1	0.1
Smallmouth bass	-	-	1	1	1	3	0.3
Tessellated darter	11	14	44	19	22	110	10.0
Banded darter	10	1	-	-	-	11	1.0

POOR ORIGINAL

Table 2.2-43

Fishes taken by seine on 19 October 1976 in the vicinity of TMINS.

Station	TM-AQF-1A2	TM-AQF-16A1	TM-AQF-10A2	TM-AQF-9A1	TM-AQF-9B3	Total	Catch
Time	1518	1437	1418	1347	1328		
Air Temp. (C)	12.0	12.0	12.5	12.0	10.0		
Water Temp. (C)	11.5	11.0	11.5	11.0	11.0		
Dissolved Oxygen (ppm)	12.4	12.7	12.7	12.5	12.4		
pH	8.1	8.1	8.1	8.1	8.2		
Secchi Disc (cm)	30	33	36	48	46		
River Stage (ft)	5.34	5.34	5.34	5.34	5.34		
Weather	Clear	Partly Cloudy	Clear	Clear	Partly Cloudy		
No. of Spmn.	49	78	265	24	90	506	
No. of Spp.	6	9	8	5	4	14	
Comely shiner	1	-	-	-	-	1	0.2
Common shiner	-	2	-	-	-	2	0.4
Spottail shiner	6	21	22	3	-	52	10.3
Swallowtail shiner	2	2	10	-	5	19	3.8
Rosyface shiner	-	1	-	-	-	1	0.2
Spotfin shiner	6	3	181	1	57	248	49.0
Bluntnose minnow	11	13	18	-	3	45	8.9
Fathead minnow	-	-	1	-	-	1	0.2
Fallfish	-	-	1	-	-	1	0.2
Rock bass	-	-	-	1	-	1	0.2
Pumpkinseed	-	-	-	1	-	1	0.2
Smallmouth bass	-	2	-	1	-	3	0.6
Tessellated darter	23	31	31	17	25	127	25.1
Banded darter	-	3	1	-	-	4	0.8

1565 093

Table 2.2-44

Fishes taken by seine on 25 October 1976 in the vicinity of TMINS.

Station	TMAQE-1A2	TMAQE-1BA1	TMAQE-1QA2	TMAQE-1WA1	TMAQE-1WA3	Total	%
Time	0938	1015	1030	1105	1125		
Air Temp. (C)	9.0	9.5	9.5	9.5	10.0		
Water Temp. (C)	7.5	7.5	8.0	7.5	7.5		
Dissolved Oxygen (ppm)	12.6	12.5	12.6	12.7	12.6		
pH	8.5	8.5	8.3	8.4	8.4		
Secchi disc (cm)	18	13	13	13	13		
River Stage (ft)	7.94	7.94	7.94	7.94	7.94		
Weather	Fog	Fog	Fog	Fog	Fog		
No. of Spmn.	178	72	67	91	123	531	
No. of Spp.	10	10	7	6	6	13	
Comely shiner	2	2	8	2	-	14	2.6
Common shiner	1	-	-	-	-	1	0.2
Spottail shiner	25	47	15	31	94	212	39.9
Swallowtail shiner	8	2	5	4	2	21	4.0
Rosyface shiner	2	3	-	-	-	5	0.9
Spotfin shiner	122	3	28	20	22	205	38.6
Bluntnose minnow	1	3	2	-	2	8	1.5
Quillback	-	-	-	-	1	1	0.2
Redbreast sunfish	-	1	-	1	-	2	0.4
Pumpkinseed	-	1	-	-	-	1	0.2
Bluegill	1	-	-	-	-	1	0.2
Smallmouth bass	1	1	2	-	-	4	0.8
Tessellated darter	5	9	7	33	2	56	10.2

POOR ORIGINAL

1565 094

Table 2.2-45

Summary of fishes taken at seine station TM-AQF-1A2 during 1976.

Month	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Total	Catch
River chub	-	-	-	-	-	1	-	-	1	+
Comely shiner	-	-	-	-	4	3	4	3	14	0.7
Common shiner	-	-	-	-	5	8	-	1	14	0.5
Spottail shiner	-	-	-	407	813	24	32	31	1307	49.4
Swallowtail shiner	4	7	4	2	-	2	10	10	39	1.4
Rosyface shiner	-	1	-	-	-	-	-	2	3	0.1
Spotfin shiner	28	6	1	28	78	13	381	138	1023	38.7
Bluntnose minnow	9	-	-	-	2	5	16	12	44	1.7
Blacknose dace	1	-	-	-	2	-	-	-	3	0.1
Longnose dace	-	-	-	1	-	-	-	-	1	+
Fallfish	-	-	-	-	-	1	-	-	1	+
White sucker	-	-	-	-	4	-	-	-	4	0.2
Northern hog sucker	-	-	-	-	-	-	2	-	2	0.1
Shorthead redhorse	-	-	-	-	1	-	2	-	3	0.1
White sucker/Shorthead redhorse	-	-	-	12	-	-	-	-	12	0.5
Channel catfish	-	-	-	-	-	-	1	-	1	+
Rock bass	-	-	-	-	1	-	1	-	2	0.1
Pumpkinseed	-	-	-	1	1	-	-	-	2	0.1
Bluegill	-	-	-	-	-	-	-	1	1	+
Smallmouth bass	-	-	1	1	11	2	2	1	18	0.7
Black crappie	-	-	-	-	-	1	-	-	1	+
Tessellated darter	4	4	1	17	2	20	57	28	133	5.0
Banded darter	3	-	-	-	-	-	10	-	13	0.5
Shield darter	-	-	-	1	-	-	-	-	1	+
No. of Spmn.	49	18	4	470	924	80	573	227	2645	
No. of Spp.	6	4	4	9	12	11	12	10	28	
No. of Coll.	3	2	2	2	2	2	3	2	18	
n/Coll	16.33	9.00	2.00	235.00	462.00	40.00	291.00	113.50	146.94	
Diversity Index	1.86	1.77	2.00	0.84	0.72	2.71	1.35	1.87	1.75	

+ = less than 0.05%.

Table 2.2-46

Summary of fishes taken at seine station TM-AQF-16A1 during 1976.

POOR ORIGINAL

Month	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Total	Catch
Golden shiner	-	-	-	-	-	-	1	-	1	+
Comely shiner	5	-	-	3	26	2	2	2	40	1.5
Common shiner	-	-	-	-	2	9	8	2	22	0.9
Spottail shiner	3	-	-	600	483	168	139	68	1461	64.4
Swallowtail shiner	4	1	-	-	-	-	-	4	9	0.4
Rosyface shiner	-	-	-	-	-	-	-	4	4	0.2
Spotfin shiner	27	5	-	16	6	23	16	6	99	4.4
Bluntnose minnow	4	-	-	-	2	10	6	16	38	1.7
Fathead minnow	1	-	-	-	-	-	-	-	1	+
Blacknose dace	1	-	-	1	-	-	-	-	2	0.1
Longnose dace	-	-	-	1	-	-	-	-	1	+
Creek chub	-	-	-	2	-	-	2	-	4	0.2
Fallfish	-	-	-	-	4	2	-	-	6	0.3
Quillback	-	-	-	-	1	-	-	-	1	+
White sucker	-	-	-	1	3	1	4	-	9	0.4
Northern hog sucker	-	-	-	-	1	-	-	-	1	+
Shorthead redhorse	-	-	-	16	6	6	2	-	30	1.3
White sucker/Shorthead redhorse	-	-	-	324	10	-	-	-	334	14.7
Channel catfish	-	-	-	-	-	-	2	-	2	0.1
Rock bass	-	-	-	-	1	4	-	-	5	0.2
Redbreast sunfish	1	-	-	-	-	1	1	1	4	0.2
Pumpkinseed	-	-	-	-	-	-	1	1	2	0.1
Bluegill	-	-	-	-	-	1	1	-	2	0.1
Smallmouth bass	-	-	1	-	12	3	3	3	22	1.0
Largemouth bass	-	-	-	-	1	-	-	-	1	+
White crappie	-	-	-	-	-	1	-	-	1	+
Black crappie	-	-	-	-	-	1	4	-	5	0.2
Tessellated darter	10	2	-	11	18	17	41	40	139	6.1
Banded darter	-	-	-	-	3	-	2	3	8	0.4
Shield darter	-	-	-	16	-	-	-	-	16	0.7
No. of Spmn.	56	8	1	991	579	249	235	150	2269	
No. of Spp.	9	3	1	10	15	15	17	12	29	
No. of Coll.	3	2	2	2	2	2	3	2	18	
n/Coll	18.67	4.00	0.50	495.50	289.50	124.50	78.33	75.00	126.06	
Diversity Index	2.34	1.30	-	1.40	1.18	1.90	2.15	2.32	1.99	

+ = less than 0.05%.

1565 095

POOR ORIGINAL

Table 2.2-47

Summary of fishes taken at seine station ZM-AQF-10A2 during 1976.

Month	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Total	% Catch
Carp	-	-	-	-	1	-	-	-	1	0.1
Cutlips minnow	-	-	-	-	-	-	1	-	1	0.1
River chub	-	-	-	-	-	1	1	-	2	0.1
Comely shiner	-	-	-	1	2	-	3	8	14	0.7
Spottail shiner	25	22	3	449	233	99	50	37	918	45.9
Swallowtail shiner	3	2	-	-	-	-	1	15	21	1.1
Bosyface shiner	4	-	-	-	-	-	-	-	4	0.2
Spotfin shiner	32	30	-	12	3	3	201	209	490	24.5
Bluntnose minnow	13	3	1	4	1	3	17	20	62	3.1
Fathead minnow	-	-	-	-	-	-	-	1	1	0.1
Longnose dace	-	-	-	2	-	-	-	-	2	0.1
Creek chub	1	-	-	9	1	-	-	-	11	0.6
Fallfish	-	-	-	-	4	1	2	1	8	0.4
White sucker	-	-	-	1	10	3	1	-	15	0.8
Shorthead redhorse	-	-	-	-	23	12	2	-	37	1.9
White sucker/Shorthead redhorse	-	-	-	133	6	-	-	-	139	7.0
White catfish	-	-	-	-	-	-	1	-	1	0.1
Channel catfish	1	-	-	-	5	-	70	-	76	3.8
Redbreast sunfish	2	-	-	2	-	-	1	-	5	0.3
Pumpkinseed	-	-	-	-	-	1	-	-	1	0.1
Bluegill	-	-	-	-	-	-	1	-	1	0.1
Smallmouth bass	-	1	1	-	5	11	1	2	21	1.1
White crappie	-	-	-	-	1	-	-	-	1	0.1
Tessellated darter	5	2	1	8	8	39	61	38	162	8.1
Banded darter	3	1	-	-	-	-	-	1	5	0.3
Shield darter	-	-	-	1	-	-	-	-	1	0.1
No. of Spmn.	89	61	6	622	303	173	414	332	2000	
No. of Spp.	10	7	4	11	13	10	16	10	25	
No. of Coll.	3	2	2	2	2	2	3	2	18	
n/Coll.	29.67	30.50	3.00	311.00	151.50	86.50	138.00	166.00	111.11	
Diversity Index	2.48	1.77	1.79	1.24	1.49	1.90	2.20	1.93	2.45	

Table 2.2-48

Summary of fishes taken at seine station ZM-AQF-9A1 during 1976.

Month	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Total	% Catch
Comely shiner	-	-		-	-	-	-	2	2	0.2
Spottail shiner	1	-		317	113	48	29	34	542	53.9
Swallowtail shiner	3	-	NO	-	-	-	-	4	7	0.7
Spotfin shiner	26	1		5	4	5	33	21	95	9.4
Bluntnose minnow	3	-		-	2	4	9	-	18	1.8
Creek chub	-	-		6	-	-	-	-	6	0.6
Fallfish	-	-		-	9	1	-	-	10	1.0
White sucker	-	-		-	12	4	1	-	17	1.7
Northern hog sucker	-	-	FISH	-	-	1	-	-	1	0.1
Shorthead redhorse	-	-		-	4	8	3	-	15	1.5
White sucker/Shorthead redhorse	-	-		88	-	-	-	-	88	8.7
Channel catfish	-	-		-	-	3	37	-	40	4.0
Rock bass	-	-		-	-	-	-	1	1	0.1
Redbreast sunfish	-	-		-	1	1	1	1	4	0.4
Pumpkinseed	-	1	TAKEN	-	-	-	-	1	2	0.2
Bluegill	-	-		1	-	2	-	-	3	0.3
Smallmouth bass	-	-		1	4	2	3	1	11	1.1
White crappie	-	-		-	3	4	-	-	7	0.7
Tessellated darter	5	-		2	10	29	39	50	135	13.4
Shield darter	-	-		2	-	-	-	-	2	0.2
No. of Spmn.	38	2	-	422	162	112	155	115	1006	
No. of Spp.	5	2	-	8	10	13	9	9	19	
No. of Coll.	3	2	2	2	2	2	3	2	18	
n/Coll.	12.67	1.00	-	211.00	81.00	56.00	51.67	57.50	55.89	
Diversity Index	1.48	1.00	-	1.06	1.75	2.55	2.47	2.00	2.39	

1565 096

POOR ORIGINAL

Table 2.2-49

Summary of fishes taken at seine station TM-A(F-98) during 1976.

Month	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Total	Pct
Comely shiner	-	-	-	-	-	1	-	-	1	-
Common shiner	1	-	-	-	-	1	-	-	2	-
Spottail shiner	1	2	1	[illegible]	252	19	[illegible]	[illegible]	[illegible]	[illegible]
Swallowtail shiner	13	1	-	-	-	-	-	7	21	-
Spotfin shiner	14	5	-	[illegible]	-	12	222	74	365	[illegible]
Bluntnose minnow	1	-	-	-	1	23	-	5	[illegible]	[illegible]
Longnose dace	-	-	-	7	-	-	-	-	7	[illegible]
Creek chub	-	-	4	24	-	-	-	-	28	[illegible]
Fallfish	-	-	-	-	3	-	-	-	3	[illegible]
Quillback	-	-	-	-	-	-	-	1	1	-
White sucker	-	-	-	-	[illegible]	1	-	-	[illegible]	[illegible]
Shorthead redhorse	-	-	-	-	1	-	1	-	-	[illegible]
White sucker/Shorthead redhorse	-	-	30	[illegible]	-	-	-	-	[illegible]	[illegible]
Yellow bullhead	-	-	-	-	-	2	-	-	2	[illegible]
Brown bullhead	-	-	-	-	2	2	-	-	4	[illegible]
Channel catfish	-	-	-	-	2	256	114	-	372	[illegible]
Redbreast sunfish	1	-	-	-	-	-	-	-	1	-
Pumpkinseed	-	-	-	-	-	-	2	-	2	[illegible]
Bluegill	-	-	-	-	-	-	2	-	2	[illegible]
Smallmouth bass	-	-	1	-	[illegible]	2	1	-	10	[illegible]
White crappie	-	-	-	-	-	14	-	-	14	[illegible]
Tessellated darter	1	-	1	1	[illegible]	37	24	27	[illegible]	[illegible]
No. of Spcn.	57	[illegible]	37	[illegible]	[illegible]	375	[illegible]	213	[illegible]	
No. of Spp.	7	[illegible]	5	[illegible]	[illegible]	12	[illegible]	[illegible]	21	
No. of Coll.	3	2	2	2	2	2	[illegible]	2	16	
n/Coll.	19.00	4.00	18.50	[illegible]	[illegible]	187.50	[illegible]	[illegible]	142.11	
Diversity Index	1.17	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	

- = less than 0.05 .

Table 2.2-50

Summary of fishes taken at seine stations during March through October 1976.

Station	TM-A(F-98)	TM-B(F-98)	TM-C(F-98)	TM-D(F-98)	TM-E(F-98)	Total	Pct %
Carp	-	-	1	-	-	1	-
Cutlips minnow	-	-	1	-	-	1	-
River chub	1	-	2	-	-	3	-
Golden shiner	-	1	-	-	-	1	-
Comely shiner	19	40	14	2	1	76	0.7
Common shiner	14	21	-	-	2	37	0.4
Spottail shiner	1307	1461	918	542	1298	5526	52.7
Swallowtail shiner	36	9	21	7	21	94	0.9
Rosyface shiner	3	4	-	-	-	11	0.1
Spotfin shiner	1023	99	493	95	365	2072	19.8
Bluntnose minnow	22	38	62	18	64	142	1.4
Fathead minnow	-	1	1	-	-	2	-
Blacknose dace	3	2	-	-	-	5	-
Longnose dace	1	1	2	-	7	11	0.1
Creek chub	-	4	11	6	28	44	0.5
Fallfish	1	6	8	10	3	28	0.3
Quillback	-	1	-	-	1	2	-
White sucker	4	9	15	17	137	182	1.7
Northern hog sucker	2	1	-	1	-	4	-
Shorthead redhorse	3	30	37	15	4	89	0.8
White sucker/Shorthead redhorse	12	334	139	88	130	703	6.7
White catfish	-	-	1	-	-	1	-
Yellow bullhead	-	-	-	-	2	2	-
Brown bullhead	-	-	-	-	9	9	0.1
Channel catfish	1	2	76	40	377	496	4.7
Rock bass	2	5	-	1	-	8	0.1
Redbreast sunfish	-	4	5	4	1	14	0.1
Pumpkinseed	2	2	1	2	2	9	0.1
Bluegill	1	2	1	3	2	9	0.1
Smallmouth bass	18	22	21	11	10	82	0.8
Largemouth bass	-	1	-	-	-	1	-
White crappie	-	1	1	7	19	28	0.3
Black crappie	1	5	-	-	-	6	0.1
Tessellated darter	133	139	162	135	109	678	6.5
Banded darter	13	8	5	-	-	26	0.2
Shield darter	1	16	1	2	-	20	0.2
No. of Spcn.	2645	2269	2000	1006	2558	10478	
No. of Spp.	23	29	25	19	21	35	
No. of Coll.	18	18	18	18	18	90	
n/Coll.	146.94	126.06	111.11	55.89	142.11	116.42	
Diversity Index	1.75	1.99	2.25	2.39	2.35	2.36	

- = less than 0.05 .

1565 097

Table 2.2-51

Monthly summary of fishes taken at seine stations upstream (U) and downstream (D) from the discharge during March through October 19[illegible].

Month	March U	March D	April U	April D	May U	May D	June U	June D	July U	July D	August U	August D	September U	September D	October U	October D
Carp	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Cutlips minnow	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
River chub	-	-	-	-	-	-	-	-	-	-	1	1	-	1	-	-
Golden shiner	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Comely shiner	5	-	-	-	-	-	1	1	10	2	5	1	11	1	5	10
Common shiner	-	1	-	-	-	-	-	-	7	-	17	1	8	-	1	-
Spottail shiner	3	27	-	26	-	6	1067	1732	1296	558	152	166	171	82	99	165
Swallowtail shiner	8	19	8	3	1	-	2	-	-	-	2	-	16	1	16	26
Rosyface shiner	-	4	1	-	-	-	-	-	-	-	-	-	-	-	6	-
Spotfin shiner	55	97	11	36	1	-	55	25	82	7	16	20	[illegible]	256	144	609
Bluntnose minnow	13	17	-	3	-	1	-	4	4	4	15	10	22	26	28	25
Fathead minnow	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Blacknose dace	2	-	-	-	-	-	1	-	2	-	-	-	-	-	-	-
Longnose dace	-	-	-	-	-	-	2	9	-	-	-	-	-	-	-	-
Creek chub	-	1	-	-	-	4	2	19	-	1	-	-	2	-	-	-
Fallfish	-	-	-	-	-	-	-	-	4	16	1	2	-	2	-	1
Quillback	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1
White sucker	-	-	-	-	-	-	1	1	7	158	1	8	4	2	-	-
Northern hog sucker	-	-	-	-	-	-	-	-	1	-	-	1	2	-	-	-
Shorthead redhorse	-	-	-	-	-	-	16	-	7	10	6	20	4	6	-	-
White sucker/Shorthead redhorse	-	-	-	-	-	10	116	121	16	6	-	-	-	-	-	-
White catfish	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Yellow bullhead	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-
Brown bullhead	-	-	-	-	-	-	-	-	-	2	-	2	-	-	-	-
Channel catfish	-	1	-	-	-	-	-	-	-	12	-	259	3	221	-	-
Rock bass	-	-	-	-	-	-	-	-	2	-	4	-	1	-	-	1
Redbreast sunfish	1	3	-	-	-	-	-	2	-	1	1	1	1	2	1	1
Pumpkinseed	-	-	-	1	-	-	1	-	1	-	-	1	1	2	1	1
Bluegill	-	-	-	-	-	-	-	1	-	-	1	2	1	1	1	-
Smallmouth bass	-	-	-	1	2	2	1	1	21	15	5	15	5	5	9	1
Largemouth bass	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
White crappie	-	-	-	-	-	-	-	-	-	6	1	24	-	-	-	-
Black crappie	-	-	-	-	-	-	-	-	-	-	2	-	4	-	-	-
Tessellated darter	14	11	6	2	1	2	28	11	20	12	17	105	98	128	68	115
Banded darter	3	1	-	1	-	-	-	-	1	-	-	-	12	-	3	1
Shield darter	-	-	-	-	-	-	17	3	-	-	-	-	-	-	-	-
No. of Spcm.	105	184	26	71	5	43	1461	2150	1504	855	329	660	1108	942	377	660
No. of Spp.	10	11	6	8	4	6	13	13	17	15	17	19	20	17	13	14
No. of Coll.	6	9	4	6	4	6	4	6	4	6	4	6	6	9	4	6
n/Coll.	17.50	20.44	6.50	11.83	1.25	7.17	365.25	358.33	375.75	142.31	82.25	110.00	184.67	104.67	94.25	110.00
Monthly Total	289		97		48		3611		2357		989		2050		1037	
N/Coll.	19.27		9.70		4.80		361.10		235.70		98.90		128.67		103.70	

Month	Total U	%	Total D	%	Total	%
Carp	-	-	1	*	1	*
Cutlips minnow	-	-	1	*	1	*
River chub	1	*	2	*	3	*
Golden shiner	1	*	-	-	1	*
Comely shiner	58	1.2	17	0.3	75	0.7
Common shiner	35	0.7	-	*	[illegible]	[illegible]
Spottail shiner	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Swallowtail shiner	45	0.9	[illegible]	[illegible]	[illegible]	[illegible]
Rosyface shiner	7	0.1	4	0.1	11	0.1
Spotfin shiner	1122	22.8	950	17.1	2072	19.8
Bluntnose minnow	82	1.7	110	2.0	192	1.8
Fathead minnow	1	*	1	*	2	*
Blacknose dace	5	0.1	-	*	5	*
Longnose dace	2	*	9	0.2	11	0.1
Creek chub	4	0.1	25	0.4	29	0.3
Fallfish	7	0.1	21	0.4	28	0.3
Quillback	1	*	1	*	2	*
White sucker	13	0.3	174	3.1	187	1.7
Northern hog sucker	4	0.1	1	*	5	*
Shorthead redhorse	33	0.7	56	1.0	89	0.8
White sucker/Shorthead redhorse	346	7.0	157	[illegible]	503	4.7
White catfish	-	-	1	*	1	*
Yellow bullhead	-	-	2	*	2	*
Brown bullhead	-	-	4	0.1	4	*
Channel catfish	3	0.1	493	8.9	496	4.7
Rock bass	7	0.1	1	*	8	0.1
Redbreast sunfish	4	0.1	10	0.2	14	0.1
Pumpkinseed	4	0.1	5	0.1	9	0.1
Bluegill	3	0.1	6	0.1	9	0.1
Smallmouth bass	40	0.8	[illegible]	0.8	82	0.8
Largemouth bass	1	*	-	*	1	*
White crappie	1	*	27	0.5	28	0.3
Black crappie	6	0.1	-	*	6	0.1
Tessellated darter	272	5.5	[illegible]	[illegible]	680	6.5
Banded darter	21	0.4	5	0.1	26	0.2
Shield darter	17	0.3	3	0.1	20	0.2
No. of Spcm.	4914		5564		10478	
No. of Spp.	30		31		35	
No. of Coll.	36		54		90	
n/Coll.	136.50		103.04		116.42	

* = less than 0.05%.

POOR ORIGINAL

1565 098

Table 2.2-52

Condition factors and reproductive status (Y = young, J = juvenile, A = adult) of channel catfish taken by trapnet during March through October 1976 downstream (D) and upstream (U) from the TMINS Discharge (number in parentheses equals specimens used in calculation).

Fork Length (5 mm groups)	March		April		May		June		July		August		September		October	
	D	U	D	U	D	U	D	U	D	U	D	U	D	U	D	U
46-50	-	0.80(1J)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
61-65	-	0.73(1J)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
66-70	0.87(1J)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
86-90	-	0.82(1J)	-	-	-	0.82(1J)	-	-	-	-	-	-	-	-	-	-
96-100	-	-	-	-	-	-	-	-	1.50(1J)	-	-	-	-	-	-	-
111-115	-	-	-	-	-	-	1.32(1J)	-	-	-	1.38(1J)	-	-	-	-	-
116-120	1.10(1J)	1.16(1J)	-	-	-	-	-	-	0.98(1J)	-		-	-	-	-	-
121-125	1.18(1J)	1.16(3J)	-	-	-	-	-	1.02(1J)	1.21(3J)	-	1.28(2J)	-	-	-	-	1.23(1J)
126-130	-	0.98(1J)	-	1.09(1J)	-	-	-	-	-	-	1.18(3J)	1.09(1J)	-	1.02(2J)	-	-
131-135	1.02(1J)	-	0.81(1J)	0.81(1J)	-	-	-	-	1.16(1J)	1.14(1J)	-	1.35(5J)	-	-	-	-
136-140	1.06(1J)	-	1.09(1J)	-	-	1.13(1J)	-	-	-	-	-	0.95(2J)	-	-	-	-
141-145	0.98(1J)	1.17(4J)	-	-	-	-	-	-	0.92(2J)	-	-	-	-	1.02(1J)	-	-
146-150	-	0.99(5J)	1.30(1J)	-	-	-	-	-	-	-	-	-	-	1.13(1J)	1.19(1J)	1.16(1J)
151-155	-	1.03(2J)	1.32(1J)	-	1.02(1J)	-	-	-	0.89(1J)	-	-	-	-	1.01(2J)	1.18(2J)	-
156-160	-	1.00(1J)	1.15(1J)	-	-	-	-	-	1.17(1J)	-	-	-	-	-	1.21(5J)	-
161-165	0.99(2J)	-	0.79(2J)	-	-	0.98(1J)	1.29(1J)	-	-	-	?	-	1.14(2J)	-	1.27(3J)	-
166-170	0.94(1J)	1.00(1J)	1.21(2J)	-	-	-	1.06(1J)	-	-	-		-	-	-	1.19(1J)	-
171-175	-	0.95(1J)	-	-	-	-	-	-	-	-	-	-	-	-	1.27(1J)	-
175-180	-	-	0.96(1J)	1.06(1J)	-	-	1.45(1J)	-	-	-	-	-	-	-	-	-
181-185	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.30(1J)
186-190	-	-	1.06(1A)	-	1.20(1A)	1.41(1A)	-	1.17(1A)	-	-	-	-	1.17(1A)	-	-	-
191-195	-	-	0.92(1A)	-	-	-	1.32(1A)	-	-	-	-	-	-	-	1.13(1A)	-
201-205	-	-	-	-	-	-	1.36(1A)	-	-	-	-	-	-	-	-	-
216-220	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.36(1A)
221-225	-	-	-	-	1.12(1A)	-	1.26(1A)	-	-	-	-	-	-	-	-	1.03(1A)
226-230	-	-	-	-	1.40(1A)	-	1.00(1A)	-	-	-	-	-	-	-	1.23(1A)	-
236-240	-	1.18(1A)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
241-245	-	-	-	-	-	-	-	-	-	-	-	-	1.17(1A)	-	-	-
246-250	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.17(1A)	1.17(1A)
251-255	-	-	1.37(2A)	-	-	-	1.33(1A)	-	-	-	-	-	-	-	1.15(3A)	-
256-260	-	-	-	-	-	-	-	-	-	-	1.19(1A)	-	-	-	-	1.32(1A)
266-270	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
276-280	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.11(2A)	-
281-285	-	-	-	-	1.27(1A)	-	-	-	1.31(1A)	-	-	-	-	-	1.11(1A)	1.17(2A)
296-300	-	-	-	-	-	-	-	-	-	-	-	1.31(1A)	-	-	1.16(1A)	
306-310	-	-	-	-	-	-	-	-	1.21(1A)	-	-	-	-	-	-	-
331-335	-	-	-	-	-	-	-	-	-	-	-	-	-	1.12(2A)	-	-
366-370	-	-	-	-	-	-	-	-	-	-	-	1.30(1A)	-	-	-	-

POOR ORIGINAL

1565 099

Table 2.2-53

Condition factors and reproductive status (Y = young, J = juvenile, A = adult) of rock bass taken by trapnet during March through [illegible] 1[illegible] upstream ([illegible]) and upstream ([illegible]) [illegible] Discharge (number in parentheses equals specimens used in calculation)

Fork Length (mm)	March		April		May		June		July		August		September		October	
	D	U	D	U	D	U	D	U	D	U	D	U	D	U	D	U
61-65	-	-	-	2.91(1J)	-	-	-	-	-	-	-	-	-	-	-	-
96-100	-	-	-	-	-	-	-	-	-	-	-	[illegible]	-	-	-	-
101-105	-	-	-	1.12(1J)	-	-	-	-	-	-	-	-	-	-	-	-
106-110	1.95(1J)	-	-	1.50(1J)	-	-	-	-	-	-	-	-	-	1.[illegible](1J)	-	-
111-115	-	-	-	-	-	2.56(1J)	-	-	-	-	-	[illegible](2J)	-	-	-	-
116-120	-	-	-	1.97(2J)	-	-	-	-	-	-	-	1.[illegible](1J)	-	-	-	[illegible]
121-125	-	-	-	2.00(1J)	-	2.25(1J)	-	-	-	-	-	-	1.[illegible](1J)	-	-	-
126-130	-	-	1.78(1J)	-	1.73(1J)	2.41(1J)	2.23(1J)	-	-	-	-	-	1.[illegible](1J)	[illegible]	-	[illegible]
131-135	-	-	-	-	-	-	-	2.32(1A)	2.19(1A)	-	-	-	-	[illegible]	-	-
136-140	-	-	-	-	-	-	-	2.66(1A)	-	-	-	-	-	-	-	[illegible]
141-145	-	-	1.71(1A)	-	2.30(1A)	-	[illegible]	[illegible]	[illegible]	-	-	1.61(1A)	-	-	-	[illegible]
146-150	2.07(1A)	-	-	-	-	-	[illegible]	[illegible]	-	-	-	-	-	-	-	-
151-155	-	-	-	-	-	-	-	-	[illegible]	-	-	-	-	-	-	-
156-160	-	-	-	-	2.11(2A)	-	[illegible]	-	[illegible]	-	-	[illegible]	1.96(1A)	-	-	-
161-165	-	-	1.60(1A)	-	-	-	-	2.17(2A)	-	-	-	-	-	[illegible]	-	[illegible]
166-170	-	-	1.87(1A)	-	-	-	[illegible]	-	-	-	[illegible]	-	[illegible]	[illegible]	-	-
171-175	-	-	[illegible]	-	2.31(2A)	-	[illegible]	-	-	-	-	-	2.11(2A)	-	-	-
176-180	-	-	-	-	-	-	-	-	[illegible]	-	-	-	[illegible]	-	-	-
181-185	-	-	[illegible]	-	[illegible]	[illegible]	[illegible]	-	-	-	-	-	[illegible]	-	-	[illegible]
186-190	-	-	-	-	-	-	-	-	-	-	-	-	[illegible]	-	-	-
191-195	-	-	[illegible]	-	-	2.[illegible](1A)	-	-	-	-	-	-	-	-	-	-
196-200	-	-	[illegible]	-	-	-	-	-	-	-	-	-	-	-	-	-
206-210	-	-	[illegible]	-	[illegible]	-	-	-	-	-	-	-	-	-	-	-
211-215	-	-	[illegible]	[illegible]	-	-	-	-	-	-	-	-	-	-	-	-
216-220	-	-	-	-	-	-	-	-	-	-	-	-	1.[illegible]	-	-	-
221-225	[illegible]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
231-235	-	-	-	-	-	-	-	-	-	-	-	-	[illegible]	-	-	-
236-240	-	-	[illegible]	-	-	[illegible]	-	-	-	-	-	-	-	-	-	-

POOR ORIGINAL

1565 100

Table 2.2-54

Condition factors and reproductive status (Y = young, J = juvenile, A = adult) of pumpkinseed taken by trapnet during March through October 1976 downstream (D) and upstream (U) from the DNPS discharge (number in parentheses equals specimens used in calculation)

Fork Length (2.5 cm Class)	March		April		May		June		July		August		September		October	
	D	U	D	U	D	U	D	U	D	U	D	U	D	U	D	U
56-60	0.93(1J)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
76-80	2.35(1J)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
81-85	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
86-90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
91-95	-	-	-	-	-	-	-	-	-	1.61(1J)	-	-	-	-	-	NP
96-100	-	-	-	-	-	2.22(1A)	-	-	-	-	-	2.31(1J)	2.33(1J)	1.85(1J)		
101-105	-	-	1.80(1A)	-	2.00(1A)	-	1.70(1A)	2.00(1A)	-	2.45(1A)	-	-	2.06(2A)	2.31(1A)		
106-110	-	-	-	1.99(2A)	2.49(6A)	2.59(1A)	-	-	-	-	-	-	2.30(1A)	2.39(1A)		
111-115	-	-	-	-	2.48(1A)	2.86(3A)	3.16(1A)	-	-	-	-	-	1.90(1A)	-		
116-120	-	-	-	1.64(1A)	2.55(5A)	2.33(2A)	-	1.71(1A)	-	2.40(1A)	-	2.03(3A)	2.03(1A)	2.25(1A)		
121-125	2.25(1A)	-	1.94(2A)	2.44(5A)	2.85(5A)	2.58(3A)	-	1.97(1A)	2.80(2A)	2.55(1A)	-	2.43(3A)	-	-		
126-130	-	-	2.15(1A)	2.25(1A)	2.66(1A)	-	2.56(1A)	2.05(1A)	-	2.36(2A)	2.41(2A)	2.29(3A)	2.40(2A)	2.64(1A)		FISH
131-135	-	1.91(1A)	2.09(1A)	2.69(2A)	2.61(7A)	2.75(3A)	2.98(2A)	2.69(1A)	2.56(7A)	2.55(6A)	2.28(2A)	2.02(2A)	-	2.25(3A)		
136-140	-	-	2.58(1A)	-	2.64(3A)	-	2.60(1A)	2.32(1A)	2.62(6A)	-	-	2.92(6A)	-	2.51(6A)		
141-145	-	-	2.48(2A)	2.48(1A)	2.80(5A)	2.81(2A)	2.79(2A)	2.25(1A)	2.51(5A)	-	-	3.01(5A)	-	2.93(5A)		
146-150	2.07(1A)	-	-	2.07(2A)	2.95(6A)	2.72(2A)	2.89(1A)	2.36(3A)	2.45(3A)	-	-	2.46(1A)	-	2.46(5A)		
151-155	-	-	2.31(1A)	2.52(1A)	-	2.67(1A)	2.87(1A)	-	2.75(3A)	2.39(1A)	2.49(2A)	-	2.49(1A)	2.60(1A)		
156-160	-	-	-	-	-	-	-	2.99(1A)	2.80(2A)	-	2.24(1A)	-	2.83(2A)	2.71(1A)		
161-165	-	-	-	-	-	3.01(1A)	-	-	-	-	-	-	2.49(1A)	-		
166-170	-	-	2.45(1A)	-	-	-	-	-	-	-	-	-	-	-		TAXIS
171-175	-	-	-	-	-	-	-	1.97(1A)	-	-	-	-	2.45(1A)	-		
														2.17(1A)		

1565 101

POOR ORIGINAL

Table 2.2-55

Condition factors and reproductive status (Y = young, J = juvenile, A = adult) of white crappie taken by trapnet during March through October 1976 downstream and upstream from the IBWSS discharge (number in parentheses equals specimens used to calculations)

Fork Length (Cm Group)	March		April		May		June		July		August		September		October	
	D	U	D	U	D	U	D	U	D	U	D	U	D	U	D	U
66-70	-	-			-	-	-	-	-	-		-	1.46(1)			
76-80	-	-			-	-	-	-	-	-	-	-	1.28(1)			
86-90	-	1.51(1J)			-	-	-	-	-	-	-	-	-			
91-95	-	-	NO		-	-	-	-	-	-		-	1.17(1)		NO	
96-100	-	-			-	-	-	-	-	-	-	-	1.70(1)			
136-140	-	-			1.75(1J)	-	-	-	-	-	-	-	-			
161-165	-	-			-	-	-	-	-	-	-	-	1.49(1A)			
166-170	-	-			-	-	-	-	-	-	-	-	1.52(1A)			
176-180	-	-			-	-	-	-	-	-	-	-	1.80(1A)			
181-185	-	-	TFN		-	-	-	-	-	1.53(1A)	-	-	-		TFN	
186-190	-	-			-	-	1.56(1A)	-	-	-	-	-	-			
196-200	-	-			-	-	-	-	1.80(1A)	-	-	-	-			
205-210	-	-			-	-	-	-	-	-	-	-	1.55(1A)			
211-215	1.52(1A)	-			-	-	-	-	-	-	-	-				
226-230	-	-			-	-	-	-	-	-		-	1.51(1A)			
231-235	-	-	TAFTN		-	-	-	-	-	-	-	-	1.5(1A)		TAFTN	
241-245	-	-			-	-	-	-	-	-	-	-	1.56(1A)			
246-250	1.65(1A)	-			-	-	-	-	-	-	-	-	-			

POOR ORIGINAL

1565 102

Table 2.2-56

Condition factors and reproductive status (Y = young, J = juvenile, A = adult) of black crappie taken by trapnet during March through October 1976 downstream (D) and upstream (U) from the PWSW discharge (number in parentheses equals specimens used in calculation).

Fork Length (5 mm groups)	March		April		May		June		July		August		September		October	
	D	U	D	U	D	U	D	U	D	U	D	U	D	U	D	U
86-70	-	-			-	-	-	-	-	-	-	-	-	1.17(1Y)	-	-
96-100	-	-			-	-	-	-	-	-	-	-	-	1.0(1Y)	-	-
116-120	-	-			1.16(1J)	-	-	-	-	-	-	-	-	-	-	-
121-125	-	-			1.43(1J)	-	-	-	-	-	-	-	-	-	-	-
126-130	114(1J)	-	NO		-	-	-	-	-	-	-	-	-	-	-	-
136-140	-	-			-	-	-	-	-	-	-	-	-	-	-	-
141-145	-	-			1.44(2J)	-	-	-	-	-	-	-	-	1.66(1J)	-	-
151-155	-	-			-	-	1.90(1A)	-	1.66(1A)	-	-	-	-	1.64(1J)	-	-
156-160	-	-			-	-	1.76(1A)	-	1.76(1A)	-	-	-	-	-	-	-
161-165	1.69(1A)	-			-	-	1.95(3A)	-	1.79(3A)	-	-	-	1.65(2A)	1.47(1A)	-	-
166-170	-	-			-	-	-	-	1.87(5A)	-	-	-	1.83(1A)	-	-	-
171-175	-	-			-	-	1.96(1A)	-	2.2-(1A)	-	-	1.98(1A)	-	1.22(1A)	-	-
176-180	-	-			-	-	1.82(1A)	-	2.06(1A)	-	1.74(2A)	-	-	-	-	-
181-185	-	-	FISH	1.8-(1A)	-	-	2.02(1A)	-	1.95(2A)	-	-	-	1.75(2A)	-	-	-
186-190	-	-			-	-	-	-	1.71(1A)	-	-	-	1.63(2A)	-	-	-
191-195	-	-			-	-	-	-	1.62(8A)	-	1.71(1A)	-	1.83(2A)	-	-	-
196-200	-	-			-	-	1.85(1A)	-	1.56(3A)	-	1.99(2A)	-	-	-	-	-
201-205	-	-			-	-	-	-	1.91(1A)	-	-	-	1.63(1A)	1.70(2A)	1.35(1A)	-
206-210	-	-			-	-	-	-	1.86(3A)	-	1.75(1A)	-	1.76(1A)	1.56(1A)	-	-
211-215	-	-			-	-	-	-	1.83(1A)	-	1.88(2A)	-	-	-	-	-
216-220	-	-			-	-	1.80(1A)	-	-	-	1.86(1A)	-	1.82(2A)	-	-	-
221-225	-	-			-	-	1.86(2A)	-	-	-	-	-	-	-	-	-
226-230	-	-			-	-	1.81(1A)	-	-	-	1.66(1A)	-	1.66(1A)	1.71(1A)	-	-
231-235	-	-			-	-	-	-	-	-	-	-	1.80(2A)	1.71(1A)	-	-
236-240	-	-	DATA		-	-	-	-	1.98(2A)	-	-	-	2.29(1A)	-	-	-
241-245	-	-			-	-	-	-	-	-	-	-	1.93(1A)	-	-	-
261-265	-	-			-	-	-	-	-	-	-	-	1.96(1A)	-	-	-

POOR ORIGINAL

1565 103

Table 2.2-57

Condition factors and reproductive status (Y = young, J = juvenile, A = adult) of spottail shiner taken by seine during March through October 1978 downstream (D) and upstream (U) from the TMINS Discharge (number in parentheses equals specimens used in calculation)

Fork length (5 mm groups)	March D	March U	April D	April U	May D	May U	June D	June U	July D	July U	August D	August U	September D	September U	October D	October U
6-10	-	-	-	-	-	-	1.11(7Y)	1.00(6Y)	-	-	-					-
11-15	-	-	-	-	-	-	0.78(17Y)	0.85(18Y)	1.[illegible]	1.05(17Y)		-				
16-20	-	-	-	-	-	-	0.83(12Y)	0.81(8Y)	0.86(15Y)	0.87(4Y)		-				
21-25	-	-	-	-	-	-	0.86(11Y)	0.85(7Y)	0.86(20Y)	0.86(15Y)	1.[illegible]	1.[illegible]				
26-30	-	-	-	-	-	-	0.82(13J)	0.75(17J)	0.8[illegible]	0.85(12J)	1.[illegible]	1.[illegible]		-		
31-35	-	-	-	-	-	-	-	-	0.86(25J)	0.82(41J)	0.96(43J)	0.99(52J)		1.[illegible]		-
36-40	-	-	-	-	-	-	-	-	0.85(11J)	0.92(27J)	1.[illegible]	0.98(54J)	1.12(2J)	1.05(72J)	1.3[illegible]	-
41-45	-	-	-	-	-	-	-	-	-	0.94(2J)	1.[illegible]	0.99(2[illegible])	0.94(26J)	1.[illegible]	1.1[illegible]	1.[illegible]
46-50	0.99(5J)	-	-	-	-	-	-	-		-	0.96(27J)	1.[illegible]	1.[illegible]	0.98([illegible])	1.[illegible]	0.9[illegible]
51-55	1.06(12J)	-	0.98(4J)	-	-	-	-	-	-		1.01(7J)	1.2[illegible]	[illegible]	1.[illegible]	0.9[illegible]	[illegible]
56-60	1.04(7J)	-	1.01(8J)	-	-	-	-	-	-	-		-	1.00(8J)	0.98(15J)	0.98(7J)	1.[illegible]
61-65	0.95(6A)	1.02(1A)	0.95(4A)	-	1.22(2A)	-	-	-	-	-		-	1.[illegible]	1.0[illegible]	0.9[illegible]	1.0[illegible]
66-70	0.99(3A)	1.01(2A)	1.05(5A)	-	1.05(1A)		-	-	-						0.92(8A)	1.0[illegible]
71-75	0.99(3A)	-	1.11(2A)	-	-				-	-	-			-		
86-90	-	-	1.12(2A)	-	-	-	-	-	-	-	-		-			-
91-95	-	-	-	-	-	-	-	-	-	-	1.26(1A)	-		-	-	-

POOR ORIGINAL

1565 104

Table 2.2-58

Condition factors and reproductive status (Y = young, J = juvenile, A = adult) of spotfin shiner taken by seine during March through October 1976 downstream (D) and upstream (U) from the TVFNS Discharge (number in parentheses equals specimens used in calculation).

Fork Length (D or U)*	March		April		May		June		July		August		Weighted Average		October	
	D	U	D	U	D	U	D	U	D	U	D	U	D	U	D	U
11-15	-		-	-		-		-	-		-					
16-20						-		-								
21-25						-		-								
26-30						-		-								
31-35						-		-								
36-40						-		-								
41-45						-		-								
46-50						-		-								
51-55	-	-		-	-	-	-		-		-	-	-			
56-60	-	-		-	-	-	-	-	-		-	-	-		-	
61-65	-	-		-	-	-	-	-	-		-	-	-		-	
66-70	-	-		-	-	-	-	-	-		-	-	-		-	
71-75	-	-	-	-	-	-		-	-		-	-	-		-	
76-80	-	-	-	-	-	-		-	-		-	-	-		-	

Table 2.2-59

Condition factors and reproductive status (Y = young, J = juvenile, A = adult) of white sucker taken by seine during March through October 19[illegible] downstream and upstream of the [illegible] Discharge (number in parentheses equals specimens used in calculation).

Fork Length (D or U)*	March		April		May		June		July		August		Weighted Average		October	
	D	U	D	U	D	U	D	U	D	U	D	U	D	U	D	U
1-20							-	-								
21-25							-	-								
26-30							-	-								
31-35							-	-								
36-40							-	-								
41-45							-	-								
46-50							-	-								
51-55							-	-								
56-60							-	-								
61-65							-	-								
66-70							-	-								
71-75							-	-								
76-80							-	-								

POOR ORIGINAL

1565 105

Table 2.—

Length frequency and mean weights per 5 mm group of fishes taken by trawl in the Tar R. downstream and upstream from the [illegible] Island.

Species	Fork length	No.	Total wt.	Mean wt.	%	Total wt.	% wt.
(5 mm groups)			(g)	(g)		(g)	
Spottail shiner	81-85				1	2	[illegible]
	86-90				2	14	[illegible]
	91-95	[illegible]			1	10	1.0
	101-105				1	11	1%
White shiner	206-210	[illegible]			1	14	1.4
Redfin pickerel	206-210	1	114	114.0	[illegible]		
Channel catfish	46-50	-	-	-	1	1	1.0
	61-65	-	-	-	1	2	2.0
	66-70	1	3	3.0	-	-	-
	131-135	1	25	25.0	-	-	-
	136-140	1	29	29.0			
	141-145	-	-	-	2	74	7.4
	151-155	-	-	-	1	44	4.4
	156-160	-	-	-	1	61	6.1
	161-165	1	46	46.0	-	-	-
	166-170	1	59	59.0	-	-	-
Largemouth bass	71-75	1	8	8.0	[illegible]		
Bluegill	41-45	1	2	2.0	[illegible]		
Yellow perch	126-130	1	36	36.0	[illegible]		

POOR ORIGINAL

1565 106

Table 2.2-62

Length frequency and mean weights per 5 mm group of fishes taken by trapnet on 29-31 March 1976 downstream and upstream from the TMINS Discharge.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Carp	566-570	NO FISH TAKEN			1	1000*	-
Spottail shiner	86-90	NO FISH TAKEN			1	7	7.0
White catfish	371-375	1	890	890.0	NO FISH TAKEN		
Brown bullhead	311-315	NO FISH TAKEN			1	430	430.0
Channel catfish	86-90	-	-	-	1	6	6.0
	116-120	-	-	-	1	20	20.0
	121-125	1	23	23.0	2	48	24.0
	126-130	-	-	-	1	20	20.0
	146-150	-	-	-	3	100	33.3
	151-155	-	-	-	1	38	38.0
	166-170	-	-	-	1	49	49.0
Margined madtom	96-100	1	7	7.0	NO FISH TAKEN		
Rock bass	106-110	1	26	26.0			
	146-150	1	70	70.0	NO FISH TAKEN		
Pumpkinseed	56-60	1	7	7.0			
	76-80	1	12	12.0			
	121-125	1	44	44.0	NO FISH TAKEN		
	146-150	1	70	70.0			
Smallmouth bass	96-100	1	12	12.0	NO FISH TAKEN		
White crappie	86-90	-	-	-	1	11	11.0
	211-215	1	151	151.0	-	-	-
Black crappie	126-130	1	25	25.0			
	161-165	1	76	76.0	NO FISH TAKEN		

* weight greater than capacity of scales.

Table 2.2-63

Length frequency and mean weights per 5 mm group of fishes taken by trapnet on 13-15 April 1976 downstream and upstream from the TMINS Discharge.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Spottail shiner	86-90	1	7	7.0			
	91-95	1	10	10.0	NO FISH TAKEN		
	96-100	4	45	11.3			
Northern hog sucker	206-210	NO FISH TAKEN			1	122	122.0
White catfish	331-335	NO FISH TAKEN			1	546	546.0
Channel catfish	131-135	1	15	15.0			
	176-180	1	56	56.0			
	186-190	1	71	71.0			
	256-260	1	240	250.0	NO FISH TAKEN		
	386-390	1	1000*	-			
	496-500	1	1000*	-			
Rock bass	116-120	-	-	-	2	44	14.0
	166-170	1	92	92.0	-	-	-
	171-175	1	112	112.0	-	-	-
	181-185	1	129	129.0	-	-	-
	196-200	1	178	178.0	-	-	-
	206-210	1	235	235.0	-	-	-
	211-215	1	232	232.0	1	220	220.0
	246-250	1	356	356.0	-	-	-
Redbreast sunfish	91-95	1	19	19.0			
	131-135	2	112	56.0	NO FISH TAKEN		
	156-160	1	85	85.0			
Pumpkinseed	129-130	1	46	46.0	-	-	-
	156-160	-	-	-	1	85	85.0
	161-165	1	110	110.0	-	-	-

* weight greater than capacity of scales.

POOR ORIGINAL

Table 2.2-64

Length frequency and mean weights per 5 mm group of fishes taken by trapnet on 26-28 April 1976 downstream and upstream from the TMINS discharge.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	Total wt. (g)	Mean wt. (g)	UPSTREAM No.	Total wt. (g)	Mean wt. (g)
Carp	601-605	1	[illegible]	-	NO FISH TAKEN		
Brown bullhead	271-275	-	-	-	1	280	280.0
	296-300	-	-	-	1	378	378.0
	316-320	2	1072	536.0	-	-	-
	321-325	2	1080	540.0	-	-	-
	326-330	1	444	444.0	-	-	-
	346-350	1	550	550.0	-	-	-
Channel catfish	126-130	-	-	-	1	24	24.0
	131-135	-	-	-	1	20	20.0
	136-140	1	30	30.0	-	-	-
	146-150	1	44	44.0	-	-	-
	151-155	1	49	49.0	-	-	-
	156-160	1	47	47.0	-	-	-
	161-165	2	71	35.5	-	-	-
	166-170	2	119	59.5	-	-	-
	176-180	-	-	-	1	62	62.0
	191-195	1	72	72.0	-	-	-
	256-260	1	240	240.0	-	-	-
Rock bass	61-65	-	-	-	1	8	8.0
	101-105	-	-	-	1	13	13.0
	106-110	1	20	20.0	-	-	-
	121-125	-	-	-	1	39	39.0
	126-130	1	39	39.0	-	-	-
	141-145	1	52	52.0	-	-	-
	161-165	1	72	72.0	-	-	-

Table 2.2-64 continued.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	Total wt. (g)	Mean wt. (g)	UPSTREAM No.	Total wt. (g)	Mean wt. (g)
Redbreast sunfish	91-95	-	-	-	1	19	19.0
	136-140	-	-	-	2	112	56.0
	146-150	1	78	78.0	-	-	-
Pumpkinseed	96-100	1	18	18.0	-	-	-
	101-105	-	-	-	2	46	23.0
	111-115	-	-	-	1	25	25.0
	116-120	2	67	33.5	5	211	42.2
	121-125	1	42	42.0	1	44	44.0
	126-130	-	-	-	2	118	59.0
	131-135	3	189	63.0	-	-	-
	136-140	2	136	68.0	1	68	68.0
	141-145	-	-	-	2	126	63.0
	146-150	1	78	78.0	-	-	-

* weight greater than capacity of scales.

POOR ORIGINAL

1565 108

Table 2.2-65

Length frequency and mean weights per 5 mm group of fishes taken by trapnet on 10-12 May 1976 downstream and upstream from the TMI-1 Discharge.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Carp	506-510	NO FISH TAKEN			1	10808	-
Spottail shiner	91-95	NO FISH TAKEN			1	7	7.0
Quillback	111-115	1	70	70.0	NO FISH TAKEN		
Yellow bullhead	266-270	2	812	406.0	NO FISH TAKEN		
Brown bullhead	311-315	NO FISH TAKEN			1	488	488.0
Channel catfish	151-155	1	98	98.0	-	-	-
	161-165	-	-	-	1	44	44.0
	186-190	1	82	82.0	-	-	-
	306-310	1	378	378.0	-	-	-
Rock bass	121-125	-	-	-	2	81	40.5
	126-130	1	38	38.0	-	-	-
	141-145	1	70	70.0	-	-	-
	156-160	2	173	86.5	-	-	-
	171-175	1	110	110.0	-	-	-
	206-210	2	430	215.0	-	-	-
Redbreast sunfish	91-95	-	-	-	1	18	18.0
	106-110	1	25	25.0	-	-	-
	111-115	-	-	-	1	39	39.0
	121-125	-	-	-	1	47	47.0
	131-135	1	66	66.0	1	52	52.0
	136-140	2	164	82.0	-	-	-
	141-145	3	233	77.7	2	151	75.5
	146-150	-	-	-	1	80	80.0
	151-155	2	204	102.0	1	98	98.0
	156-160	5	512	102.4	-	-	-
	166-170	2	238	119.0	-	-	-
	171-175	1	106	106.0	-	-	-
	191-195	1	180	180.0	-	-	-
	196-200	1	180	180.0	-	-	-

Table 2.2-65 continued.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Pumpkinseed	91-95	-	-	-	1	19	19.0
	96-100	1	20	20.0	-	-	-
	101-105	4	103	25.8	-	-	-
	106-110	-	-	-	2	58	29.0
	111-115	2	69	34.5	2	71	35.5
	116-120	4	170	42.5	2	88	44.0
	121-125	1	52	52.0	-	-	-
	126-130	7	402	57.4	1	60	60.0
	131-135	1	58	58.0	-	-	-
	136-140	2	146	73.0	-	-	-
	141-145	2	180	90.0	-	-	-
Bluegill	96-100	-	-	-	1	20	20.0
	111-115	1	30	30.0	-	-	-
	131-135	1	55	55.0	-	-	-
Smallmouth bass	76-80	1	4	5.0	NO FISH TAKEN		
White crappie	136-140	1	48	48.0	NO FISH TAKEN		
Black crappie	116-120	1	20	20.0			
	121-125	1	28	28.0	NO FISH TAKEN		
	141-145	2	88	44.0			
	181-185	1	115	115.0			

* weight greater than capacity of scales.

POOR ORIGINAL

1565 109

Table 2.2-66

Length frequency and mean weights per 5 mm group of fishes taken by trapnet on 26-28 May 1976 downstream and upstream from the IMIS Discharge.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Spottin shiner	71-75	1	4	4.0			
	76-80	1	7	7.0			
	86-90	1	12	12.0	NO FISH TAKEN		
	91-95	1	7	7.0			
	96-100	1	14	14.0			
	101-105	1	18	18.0			
White sucker	256-260	1	265	265.0	NO FISH TAKEN		
Brown bullhead	316-320	-	-	-	1	547	547.0
	326-330	-	-	-	1	619	619.0
	351-355	1	788	788.0	-	-	-
Channel catfish	86-90	-	-	-	1	6	6.0
	136-140	-	-	-	1	31	31.0
	186-190	-	-	-	1	97	97.0
	221-225	1	128	128.0	-	-	-
	226-230	1	170	170.0	-	-	-
Margined madtom	126-130	NO FISH TAKEN			1	70	70.0
Rock bass	111-115	-	-	-	1	38	38.0
	121-125	-	-	-	1	50	50.0
	126-130	-	-	-	1	53	53.0
	171-175	1	140	140.0	-	-	-
	181-185	1	145	145.0	1	163	163.0
	196-200	-	-	-	1	208	208.0
	236-240	-	-	-	1	325	325.0
Redbreast sunfish	146-150	1	108	108.0	1	95	95.0
	151-155	2	213	106.5	1	121	121.0
	156-160	1	128	128.0	1	115	115.0
Pumpkinseed	101-105	2	70	35.0	1	30	30.0
	106-110	1	33	33.0	-	-	-
	111-115	2	86	43.0	-	-	-
	116-120	1	59	59.0	1	46	46.0
	126-130	-	-	-	2	121	60.5
	131-135	2	137	68.5	-	-	-
	136-140	3	238	79.3	2	154	77.0
	141-145	1	90	90.0	2	166	83.0
	146-150	-	-	-	1	90	90.0
	156-160	-	-	-	1	124	124.0

Table 2.2-67

Length frequency and mean weights per 5 mm group of fishes taken by trapnet on 7-9 June 1976 downstream and upstream from the IMIS Discharge.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
White sucker	411-415	1	1000*	-	NO FISH TAKEN		
Brown bullhead	251-255	1	308	308.0			
	316-320	1	590	590.0	NO FISH TAKEN		
Channel catfish	166-170	1	51	51.0	NO FISH TAKEN		
Rock bass	126-130	1	60	60.0	-	-	-
	141-145	1	75	75.0	-	-	-
	156-160	1	100	100.0	-	-	-
	161-165	-	-	-	1	100	100.0
	166-170	1	110	110.0	-	-	-
Redbreast sunfish	116-120	1	56	56.0	-	-	-
	121-125	-	-	-	1	56	56.0
	126-130	1	54	54.0	-	-	-
	131-135	-	-	-	1	62	62.0
Pumpkinseed	96-100	1	17	17.0	1	20	20.0
	106-110	1	42	42.0	-	-	-
	126-130	1	63	63.0	-	-	-
	141-145	1	82	82.0	1	80	80.0
	146-150	1	97	97.0	-	-	-
	151-155	-	-	-	1	108	108.0
Black crappie	161-165	1	101	101.0			
	171-175	1	104	104.0	NO FISH TAKEN		
	181-185	1	128	128.0			

* weight greater than capacity of scales.

1565 110

POOR ORIGINAL

Table 2.2-68

Length frequency and mean weights per 5 mm group of fishes taken by trapnet on 29 June - 1 July 1976 downstream and upstream from the THTNS Discharge.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Carp	336-340		NO FISH TAKEN		1	1000*	-
	541-545				1	1000*	-
Quillback	366-370	1	1000*	-	NO FISH TAKEN		
White sucker	295-300	NO FISH TAKEN			1	380	380.0
Shorthead redhorse	221-225	1	164	164.0	NO FISH TAKEN		
Brown bullhead	211-215	1	118	118.0	-	-	-
	281-285	1	452	452.0	-	-	-
	301-305	-	-	-	1	380	380.0
	316-320	1	490	490.0	-	-	-
	321-325	1	524	524.0	-	-	-
	326-330	1	548	548.0	-	-	-
	336-340	1	588	588.0	-	-	-
	341-345	1	538	538.0	-	-	-
	361-365	1	715	715.0	-	-	-
Channel catfish	111-115	1	20	20.0	-	-	-
	121-125	-	-	-	1	20	20.0
	161-165	1	58	58.0	-	-	-
	176-180	1	84	84.0	-	-	-
	186-190	-	-	-	1	80	80.0
	191-195	1	98	98.0	-	-	-
	201-205	1	100	100.0	-	-	-
	221-225	1	143	143.0	-	-	-
	226-230	1	122	122.0	-	-	-
	251-255	1	220	220.0	-	-	-
Margined madtom	91-95	1	NA	NA	NO FISH TAKEN		
	111-115	1	11	11.0			

Table 2.2-68 continued.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Rock bass	131-135	-	-	-	1	57	57.0
	136-140	-	-	-	1	67	67.0
	141-145	1	90	90.0	2	142	71.0
	146-150	2	145	72.5	1	72	72.0
	156-160	1	102	102.0	-	-	-
	161-165	-	-	-	1	95	95.0
	171-175	1	120	120.0	-	-	-
	181-185	2	279	139.5	-	-	-
Redbreast sunfish	146-150	1	82	82.0	-	-	-
	156-160	-	-	-	1	103	103.0
	166-170	1	158	158.0	-	-	-
Pumpkinseed	111-115	-	-	-	1	26	26.0
	116-120	-	-	-	1	34	34.0
	121-125	1	50	50.0	1	40	40.0
	126-130	1	68	68.0	1	59	59.0
	131-135	1	64	64.0	1	57	57.0
	136-140	2	153	76.5	1	62	62.0
	141-145	-	-	-	1	64	64.0
	146-150	-	-	-	1	92	92.0
Smallmouth bass	171-175	1	99	99.0	NO FISH TAKEN		
White crappie	196-200	1	100	100.0	NO FISH TAKEN		
Black crappie	151-155	1	73	73.0			
	156-160	1	77	77.0			
	161-165	2	162	81.0			
	176-180	1	106	106.0	NO FISH TAKEN		
	196-200	1	148	148.0			
	216-220	1	192	192.0			
	221-225	2	420	210.0			
	226-230	1	230	230.0			
Walleye	91-95	1	58	58	NO FISH TAKEN		

* weight greater than capacity of scales.
NA = Not Available.

POOR ORIGINAL

1565 111

Table 2.2-69

Length frequency and mean weights per 5 mm group of fishes taken by trapnet on 6-8 July 1976 downstream and upstream from the EMSS Discharge.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Carp	576-580	1	1000*	-	NO FISH TAKEN		
Golden shiner	151-155	-	-	-	1	58	58.0
	171-175	1	62	62.0	-	-	-
Quillback	326-330				1	552	552.0
	356-360	NO FISH TAKEN			1	1000*	-
	396-400				1	1000*	-
Brown bullhead	291-295	1	478	478.0	-	-	-
	326-330	1	534	534.0	-	-	-
	331-335	-	-	-	1	592	592.0
Channel catfish	121-125	1	24	24.0	-	-	-
	131-135	-	-	-	1	28	28.0
	156-160	1	56	56.0	-	-	-
	306-310	1	366	366.0	-	-	-
Rock bass	131-135	1	54	54.0			
	141-145	1	88	88.0			
	151-155	1	92	92.0	NO FISH TAKEN		
	156-160	1	99	99.0			
	176-180	1	134	1.0			
Redbreast sunfish	146-150	-	-	-	1	86	86.0
	151-155	1	97	7.0	-	-	-

Table 2.2-69 continued.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Pumpkinseed	106-110	-	-	-	1	32	32.0
	116-120	1	50	50.0	1	44	44.0
	121-125	-	-	-	1	50	50.0
	126-130	4	234	58.5	4	234	58.0
	131-135	2	120	60.0	-	-	-
	136-140	2	128	64.0	-	-	-
	141-145	3	225	74.7	-	-	-
	146-150	-	-	-	1	100	100.0
	151-155	1	100	100.0	-	-	-
Bluegill	146-150	1	76	76.0			
	156-160	2	260	130.0	NO FISH TAKEN		
Largemouth bass	166-170	1	90	90.0	NO FISH TAKEN		
White crappie	196-200	1	110	110.0	NO FISH TAKEN		
Black crappie	151-155	1	62	62.0			
	161-165	1	82	82.0			
	176-180	1	120	120.0	NO FISH TAKEN		
	191-195	1	120	120.0			
	196-200	1	164	164.0			
	236-240	2	548	274.0			

* weight greater than capacity of scales.

1565 112

POOR ORIGINAL

Table 2.2-70

Length frequency and mean weights per 5 mm group of fishes taken by trapnet on 19-21 July 1976 downstream and upstream from the THTP discharge.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Carp	551-555	1	1000*	-			
	596-600	1	1000*	-	30 FISH TAKEN		
Golden shiner	161-165	2	140	70,0			
	176-180	1	68	68,0	30 FISH TAKEN		
Spottail shiner	96-100	1	13	13,0	30 FISH TAKEN		
Spottail shiner	86-90	1	9	9,0	30 FISH TAKEN		
Quillback	146-150	1	775	775,0	30 FISH TAKEN		
White catfish	251-255	1	250	250,0	30 FISH TAKEN		
Brown bullhead	211-215	1	115	115,0	-	-	-
	241-245	1	202	202,0	-	-	-
	266-270	-	-	-	1	294	294,0
	281-285	1	275	275,0	-	-	-
	306-310	-	-	-	1	470	470,0
	316-320	-	-	-	1	460	460,0
Channel catfish	96-100	1	15	15,0			
	116-120	1	17	17,0			
	121-125	2	47	24,5			
	131-135	1	29	29,0	30 FISH TAKEN		
	141-145	2	59	29,5			
	151-155	1	33	33,0			
	281-285	1	303	303,0			

Table 2.2-70 continued.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Hargbred sunfish	126-130	1	20	20,0	30 FISH TAKEN		
Rock bass	151-155	2	222	111,0	30 FISH TAKEN		
	156-160	1	102	102,0			
Pumpkinseed	81-85	-	-	-	1	10	10,0
	91-95	-	-	-	1	21	21,0
	116-120	1	49	49,0	-	-	-
	121-125	-	-	-	1	43	43,0
	126-130	3	160	53,3	-	-	-
	131-135	2	138	69,0	-	-	-
	136-140	1	80	80,0	-	-	-
	141-145	1	92	92,0	-	-	-
	151-155	1	98	98,0	-	-	-
Bluegill	136-140	-	-	-	1	62	62,0
	151-155	1	71	71,0	-	-	-
Black crappie	156-160	1	72	72,0			
	161-165	2	159	79,5			
	166-170	2	184	92,0			
	171-175	1	118	118,0			
	181-185	2	247	123,5	30 FISH TAKEN		
	186-190	1	117	117,0			
	196-200	2	228	114,0			
	201-205	1	139	139,0			
	206-210	1	170	170,0			
	211-215	1	183	183,0			
Yellow perch	186-190	1	97	97,0			
	196-200	1	111	111,0	30 FISH TAKEN		

* weight greater than capacity of scales.

POOR ORIGINAL

1565 113

Table 2.2-71

Length frequency and mean weights per 5 mm group of fishes taken by trapnet on 2-4 August 1976 downstream and upstream from the PNPS Discharge.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Carp	511-515	-	-	-	1	1000*	-
	571-575	1	1000*	-	-	-	-
Golden shiner	156-160	1	57	57.0			
	161-165	1	72	72.0	30 FISH TAKEN		
	191-195	1	102	102.0			
Quillback	376-380	1	1000*	-			
	401-405	1	1000*	-	30 FISH TAKEN		
Brown bullhead	251-255	-	-	-	1	211	211.0
	291-295	1	366	366.0	-	-	-
	301-305	-	-	-	1	441	441.0
Channel catfish	111-115	1	21	21.0	-	-	-
	121-125	2	50	25.0	-	-	-
	126-130	3	78	26.0	1	22	22.0
	131-135	-	-	-	5	142	28.4
	136-140	-	-	-	2	52	26.0
	296-300	-	-	-	1	322	322.0
Rock bass	96-100				2	45	22.5
	111-115				1	30	30.0
	116-120				1	27	27.0
	141-145	30 FISH TAKEN			1	43	43.0
	156-160				1	82	82.0
Redbreast sunfish	151-155	-	-	-	2	160	80.0
	156-160	1	100	100.0	-	-	-
	161-165	1	110	110.0	-	-	-
	171-175	-	-	-	1	120	120.0

Table 2.2-71 continued.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Pumpkinseed	86-90	-	-	-	1	17	17.0
	111-115	-	-	-	1	37	37.0
	116-120	-	-	-	1	117	117.0
	121-125	2	95	47.0	2	79	39.5
	126-130	1	52	52.0	3	139	46.3
	131-135	-	-	-	4	226	56.5
	136-140	-	-	-	1	88	88.0
	141-145	1	83	83.0	-	-	-
	146-150	1	85	85.0	1	94	94.0
Bluegill	111-115	1	41	41.0			
	126-130	1	50	50.0			
	156-160	1	112	112.0	30 FISH TAKEN		
	166-170	1	170	170.0			
White crappie	181-185	1	97	97.0	30 FISH TAKEN		
Black crappie	176-180	1	107	107.0			
	191-195	1	128	128.0			
	196-200	2	318	159.0	30 FISH TAKEN		
	211-215	2	373	186.5			
	226-230	1	203	203.0			
Walleye	121-125	1	21	21.0	30 FISH TAKEN		

* weight greater than capacity of scales.

1565 1114

POOR ORIGINAL

Table 2.2-72

Length frequency and mean weights per 5 mm group of fishes taken by trapnet on 16-18 August 1976 downstream and upstream from the EMINS Discharge.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Carp	516-520	1	10000*	-	NO FISH TAKEN		
Quillback	371-375	-	-	-	1	10000*	-
	411-415	-	-	-	1	10000*	-
	416-420	1	10000*	-	-	-	-
White sucker	271-275	1	254	254.0	-	-	-
	321-325	1	480	480.0	1	458	458.0
Channel catfish	256-260	1	208	208.0	-	-	-
	366-370	-	-	-	1	555	555.0
Rock bass	111-115	-	-	-	1	36	36.0
	166-170	1	114	114.0	-	-	-
Redbreast sunfish	91-95	-	-	-	1	21	21.0
	116-120	2	236	118.0	-	-	-
Pumpkinseed	106-110	-	-	-	1	22	22.0
	126-130	1	48	48.0	1	44	43.0
	141-145	1	68	68.0	-	-	-
	151-155	1	83	83.0	-	-	-
Bluegill	161-165	1	112	112.0	NO FISH TAKEN		
Black crappie	171-175	-	-	-	1	106	106.0
	176-180	1	96	96.0	-	-	-
	206-210	1	162	162.0	-	-	-
	216-220	1	198	198.0	-	-	-
Yellow perch	216-220	1	131	131.0	NO FISH TAKEN		

*Weight greater than capacity of scales.

Table 2.2-73

Length frequency and mean weights per 5 mm group of fishes taken by trapnet on 1-3 September 1976 downstream and upstream from the EMINS Discharge.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Quillback	371-375	1	10000*	-	NO FISH TAKEN		
White catfish	216-220	NO FISH TAKEN			1	139	139.0
Yellow bullhead	276-280	NO FISH TAKEN			1	330	330.0
Channel catfish	126-130	-	-	-	2	45	22.5
	141-145	-	-	-	1	91	91.0
	146-150	-	-	-	1	38	38.0
	151-155	-	-	-	2	77	38.5
	161-165	1	46	46.0	-	-	-
	311-315	-	-	-	1	420	420.0
	466-470	-	-	-	1	10000*	-
Rock bass	106-110	-	-	-	1	24	24.0
	126-130	1	41	41.0	-	-	-
	166-170	-	-	-	1	100	100.0
	171-175	1	118	118.0	-	-	-
	216-220	1	160	160.0	-	-	-
Pumpkinseed	121-125				1	38	38.0
	126-130				2	114	57.0
	131-135	NO FISH TAKEN			2	106	53.0
	136-140				1	66	66.0
	141-145				1	82	82.0
Bluegill	66-70	1	NA	NA	NO FISH TAKEN		
	111-115	1	41	41.0			
White crappie	161-165	1	82	82.0	NO FISH TAKEN		
Black crappie	161-165	2	148	74.0	-	-	-
	181-185	1	104	104.0	-	-	-
	186-190	1	120	120.0	-	-	-
	206-210	-	-	-	1	152	152.0
	226-230	-	-	-	1	210	210.0
	261-265	1	442	442.0	-	-	-
Walleye	171-175	NO FISH TAKEN			1	47	47.0
	181-185				1	61	61.0

*Weight greater than capacity of scales.
NA = Not Available.

POOR ORIGINAL

Table 2.2-74

Length frequency and mean weights per 5 mm group of fishes taken by trapnet on 13-15 September 1976 downstream and upstream from the TMIN Discharge.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Alewife#	136-140	2	71	35.5	30 FISH TAKEN		
Muskellunge	496-500	1	1000*	-	30 FISH TAKEN		
Carp	431-435	-	-	-	1	1000*	-
	501-505	-	-	-	1	1000*	-
	551-555	1	1000*	-	-	-	-
	621-625	1	1000*	-	-	-	-
	641-645	1	1000*	-	-	-	-
Golden shiner	166-170	2	153	76.5			
	176-180	1	93	93.0			
	186-190	1	108	108.0	30 FISH TAKEN		
	196-200	1	130	130.0			
Quillback	316-320	1	672	672.0			
	346-350	1	839	839.0			
	356-360	1	730	730.0	30 FISH TAKEN		
	371-375	1	1000*	-			
	381-385	1	1000*	-			
White sucker	336-340	30 FISH TAKEN			1	608	608.0
Brown bullhead	321-325	1	530	530.0	30 FISH TAKEN		
Channel catfish	161-165	1	56	56.0	30 FISH TAKEN		
Rock bass	131-135	-	-	-	1	50	50.0
	166-170	1	110	110.0	-	-	-
	171-175	1	108	108.0	-	-	-
	176-180	2	249	124.5	-	-	-
	181-185	1	141	141.0	-	-	-
	231-235	1	300	300.0	-	-	-
Redbreast sunfish	76-80	1	6	6.0			
	91-95	1	12	12.0			
	146-150	1	77	77.0	30 FISH TAKEN		
	151-155	1	100	100.0			
	171-175	1	393	131.0			

Table 2.2-74 continued.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Pumpkinseed	86-90	1	17	17.0	1	15	15.0
	91-95	2	35	17.5	1	20	20.0
	96-100	-	-	-	1	23	23.0
	116-120	-	-	-	1	43	43.0
	121-125	-	-	-	1	44	44.0
	126-130	-	-	-	1	57	57.0
	136-140	-	-	-	3	189	63.0
	141-145	1	76	76.0	-	-	-
	146-150	1	86	86.0	1	90	90.0
	151-155	1	108	108.0	-	-	-
	166-170	1	130	130.0	-	-	-
Bluegill	96-100	1	17	17.0			
	106-110	2	75	37.5			
	141-145	1	50	50.0	30 FISH TAKEN		
	166-170	1	125	125.0			
White crappie	76-80	1	4	4.0			
	176-180	1	76	76.0			
	226-230	1	184	184.0	30 FISH TAKEN		
	231-235	1	207	207.0			
Black crappie	136-140	-	-	-	1	40	40.0
	141-145	-	-	-	1	50	50.0
	161-165	-	-	-	1	66	66.0
	166-170	1	90	90.0	-	-	-
	171-175	-	-	-	1	95	95.0
	181-185	1	117	117.0	-	-	-
	186-190	1	103	103.0	-	-	-
	191-195	1	136	136.0	-	-	-
	201-205	-	-	-	2	293	146.5
	206-210	1	163	163.0	-	-	-
	216-220	1	199	199.0	-	-	-
	226-230	1	200	200.0	-	-	-
	231-235	1	236	236.0	1	220	220.0
Walleye	211-215	1	104	104.0	30 FISH TAKEN		

weights taken after preservation in 10% formalin.
* weight greater than capacity of scales.

POOR ORIGINAL

1565 116

Table 2.2-75

Length frequency and mean weights per 5 mm group of fishes taken by trapnet on 27-29 September 1976 downstream and upstream from the TMINS Discharge.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Golden shiner	161-165	1	76	76.0			
	181-185	3	300	100.0	NO FISH TAKEN		
	216-220	1	176	176.0			
Quillback	351-355	1	1000*	-	NO FISH TAKEN		
	356-360	1	867	867.0			
Yellow bullhead	276-280	NO FISH TAKEN			1	335	335.0
Brown bullhead	306-310	1	448	448.0	NO FISH TAKEN		
	311-315	1	410	410.0			
Channel catfish	186-190	1	80	80.0			
	241-245	1	172	172.0	NO FISH TAKEN		
Rock bass	121-125	1	38	38.0	-	-	-
	126-130	-	-	-	1	46	46.0
	156-160	1	80	80.0	-	-	-
	161-165	-	-	-	1	93	93.0
	176-180	1	140	140.0	-	-	-
	181-185	1	174	174.0	-	-	-
	191-195	1	186	186.0	-	-	-
Redbreast sunfish	86-90	-	-	-	1	9	9.0
	116-120	-	-	-	1	37	37.0
	156-160	1	110	110.0	-	-	-
	166-170	1	126	126.0	-	-	-
Pumpkinseed	86-90	-	-	-	1	12	12.0
	96-100	1	23	23.0	-	-	-
	101-105	1	22	22.0	-	-	-
	106-110	1	27	27.0	1	30	30.0
	116-120	2	83	41.5	-	-	-
	121-125	-	-	-	1	50	50.0
	126-130	-	-	-	1	50	50.0
	131-135	-	-	-	2	123	61.5
	136-140	-	-	-	1	82	82.0
	146-150	2	164	82.0	3	276	92.0
	151-155	1	106	106.0	-	-	-
	156-160	1	102	102.0	-	-	-
	171-175	-	-	-	1	127	127.0

Table 2.2-75 continued.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Bluegill	171-175	1	154	154.0	NO FISH TAKEN		
White crappie	66-70	1	5	5.0			
	91-95	1	10	10.0			
	96-100	1	10	10.0			
	166-170	1	77	77.0	NO FISH TAKEN		
	206-210	1	134	134.0			
	231-235	2	390	195.0			
	241-245	1	230	230.0			
Black crappie	66-70	-	-	-	1	4	4.0
	96-100	-	-	-	1	18	18.0
	191-195	1	136	136.0	-	-	-
	201-205	1	140	140.0	-	-	-
	216-220	1	188	188.0	-	-	-
	231-235	1	230	230.0	-	-	-
	236-240	1	317	317.0	-	-	-
	241-245	1	284	284.0	-	-	-

* weight greater than capacity of scales.

POOR ORIGINAL

1565 1117

Table 2.2-76

Length frequency and mean weights per 5 mm group of fishes taken by trapnet on 18-20 October 1976 downstream and upstream from the TMI-2 discharge.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Carp	671-675	1	1000*	-			
					NO FISH TAKEN		
	726-730	1	1000*	-			
Channel catfish	121-125	-	-	-	1	24	24.0
	146-150	-	-	-	1	39	39.0
	151-155	1	55	55.0	-	-	-
	156-160	1	62	62.0	-	-	-
	161-165	3	164	54.7	-	-	-
	171-175	1	68	68.0	-	-	-
	181-185	-	-	-	1	86	86.0
	216-220	-	-	-	1	124	124.0
	221-225	-	-	-	1	117	117.0
	226-230	1	150	150.0	-	-	-
	246-250	-	-	-	1	175	175.0
	256-260	2	425	212.5	-	-	-
	266-270	-	-	-	1	230	230.0
	276-280	1	196	196.0	-	-	-
	281-285	1	256	256.0	1	282	282.0
	296-300	1	309	309.0	-	-	-
	301-305	1	368	368.0	-	-	-
	311-315	-	-	-	1	307	307.0
	316-320	1	475	475.0	1	476	476.0
	331-335	1	430	430.0	-	-	-
Rock bass	116-120				1	31	31.0
	126-130				1	42	42.0
	136-140	NO FISH TAKEN			1	62	62.0
	141-145				1	64	64.0
	161-165				1	91	91.0
	181-185				1	153	153.0
Bluegill	281-285	1	152	152.0	NO FISH TAKEN		
Galleye	246-250	1	163	163.0	NO FISH TAKEN		

* weight greater than capacity of scales.

Table 2.2-77

Length frequency and mean weights per 5 mm group of fishes taken by trapnet on 25-27 October 1976 downstream and upstream from the TMI-2 discharge.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Spottail shiner	96-100	1	11	11.0	NO FISH TAKEN		
Channel catfish	146-150	1	50	50.0			
	151-155	1	48	48.0			
	156-160	2	196	46.5			
	166-170	1	58	58.0			
	191-195	1	88	88.0	NO FISH TAKEN		
	246-250	1	182	182.0			
	256-260	1	204	204.0			
	276-280	1	450	450.0			
Yellow perch	191-195	1	12	12.0	NO FISH TAKEN		
Black crappie	201-205	1	116	116.0	NO FISH TAKEN		

POOR ORIGINAL

1565 118

Table 2.2-78

Length frequency and mean weights per 5 mm group of fishes taken by seine on 2 March 1976 downstream and upstream from the IMINCO discharge.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Comely shiner	31-35				1	0.3	0.30
	56-60	NO FISH TAKEN					
	61-65				1	2.0	2.00
Common shiner	21-25	1	0.2	0.20	NO FISH TAKEN		
Spottail shiner	46-50	1	1.1	1.10	-	-	-
	61-65	-	-	-	1	2.8	2.80
	66-70	-	-	-	1	3.9	3.90
Swallowtail shiner	16-20	1	0.1	0.10	-	-	-
	21-25	6	0.8	0.13	-	-	-
	31-35	1	0.4	0.40	-	-	-
	36-40	-	-	-	1	0.6	0.60
Spotfin shiner	16-20	7	0.6	0.09	2	0.1	0.05
	21-25	19	2.1	0.11	4	0.5	0.13
	26-30	8	1.3	0.16	2	0.4	0.20
	31-35	3	0.9	0.30	2	0.8	0.40
	36-40	1	0.6	0.60	2	1.0	0.50
	41-45	-	-	-	1	0.8	0.80
Bluntnose minnow	21-25	1	0.2	0.20	-	-	-
	31-35	1	0.4	0.40	-	-	-
	36-40	-	-	-	1	0.5	0.50
	41-45	-	-	-	1	0.8	0.80
	51-55	-	-	-	1	1.2	1.30
Blacknose dace	21-25	NO FISH TAKEN			1	0.3	0.30
Redbreast sunfish	31-35	-	-	-	1	0.6	0.60
	36-40	1	1.0	1.00	-	-	-
Tessellated darter	41-45	1	0.5	0.50			
	56-60	2	2.4	1.20	NO FISH TAKEN		
Banded darter	36-40	NO FISH TAKEN			1	0.4	0.40
	41-45				2	1.2	0.60

Table 2.2-79

Length frequency and mean weights per 5 mm group of fishes taken by seine on 15 March 1976 downstream and upstream from the IMINCO discharge.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Comely shiner	31-35	NO FISH TAKEN			2	0.7	0.35
Spottail shiner	46-50	2	2.6	1.30			
	51-55	1	1.6	1.60			
	56-60	1	1.8	1.80	NO FISH TAKEN		
	66-70	1	3.3	3.30			
Swallowtail shiner	16-20	1	0.1	0.10	-	-	-
	21-25	-	-	-	3	0.5	0.17
	26-30	2	0.5	0.25	1	0.1	0.10
	31-35	-	-	-	1	0.4	0.40
	36-40	1	0.6	0.60	-	-	-
Rosyface shiner	46-50	1	1.0	1.00	NO FISH TAKEN		
	56-60	1	1.4	1.40			
	61-65	2	4.6	2.30			
Spotfin shiner	16-20	-	-	-	10	0.7	0.07
	21-25	8	1.0	0.13	7	0.9	0.13
	26-30	8	1.6	0.20	7	1.4	0.20
	31-35	13	4.3	0.33	7	2.1	0.30
	36-40	4	1.9	0.48	2	1.0	0.50
	41-45	2	1.5	0.75	-	-	-
	51-55	2	3.0	1.50	-	-	-
	56-60	2	3.7	1.85	-	-	-
Bluntnose minnow	31-35	3	1.4	0.47	1	0.4	0.40
	36-40	-	-	-	1	0.7	0.70
	41-45	1	0.7	0.70	3	2.1	0.70
	46-50	2	2.4	1.20	-	-	-
	51-55	-	-	-	1	1.5	1.50
Fathead minnow	51-55	NO FISH TAKEN			1	2.1	2.10
Redeye bass	46-50	2	3.7	1.85	NO FISH TAKEN		
Tessellated darter	41-45	1	0.7	0.70			
	51-55	1	1.3	1.30	NO FISH TAKEN		

POOR ORIGINAL

1565 119

Table 2.2-80

Length frequency and mean weights per 5 mm group of fishes taken by seine on 29 March 1976 downstream and upstream from the IMIS Discharge.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Spottail shiner	46-50	2	2.5	1.25	-	-	-
	51-55	2	3.7	1.85	-	-	-
	56-60	6	14.0	2.33	-	-	-
	61-65	6	15.6	2.60	-	-	-
	66-70	2	6.0	3.00	1	3.2	3.20
	71-75	1	12.2	5.17	-	-	-
Swallowtail shiner	26-30	4	0.8	0.20			
	31-35	2	0.6	0.30		NO FISH TAKEN	
	36-40	1	0.5	0.50			
Spotfin shiner	21-25	1	0.1	0.10	2	0.3	0.15
	26-30	4	1.0	0.25	1	0.3	0.30
	31-35	1	0.4	0.40	-	-	-
	36-40	9	5.1	0.57	3	1.8	0.60
	41-45	2	1.8	0.90	2	1.5	0.75
	46-50	2	2.1	1.05	1	0.9	0.90
Bluntnose minnow	36-40	-	-	-	1	0.6	0.60
	41-45	6	5.1	0.88	2	1.9	0.95
	51-55	2	3.3	1.65	-	-	-
	56-60	1	2.0	2.00	1	2.7	2.70
Blacknose dace	26-30		NO FISH TAKEN		1	0.5	0.50
Creek chub	36-40	1	0.7	0.70		NO FISH TAKEN	
Channel catfish	66-70	1	3.0	3.00		NO FISH TAKEN	
Tessellated darter	41-45	2	1.3	0.65	4	2.5	0.63
	46-50	1	0.8	0.80	3	2.5	0.83
	51-55	3	3.0	1.00	6	7.0	1.17
	56-60	-	-	-	1	1.3	1.30
Banded darter	36-40	2	1.0	0.50		NO FISH TAKEN	
	41-45	1	0.7	0.70			

Table 2.2-81

Length frequency and mean weights per 5 mm group of fishes taken by seine on 11 April 1976 downstream and upstream from the IMIS Discharge.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Spottail shiner	51-55	1	2.6	2.60			
	56-60	6	12.5	2.08			
	61-65	1	2.6	2.60			
	66-70	4	14.4	3.60		NO FISH TAKEN	
	71-75	2	8.4	4.20			
	86-90	2	17.0	8.50			
Swallowtail shiner	16-20	-	-	-	1	0.1*	-
	26-30	2	0.5	0.25	-	-	-
Rosyface shiner	61-65		NO FISH TAKEN		1	2.5	2.50
Spotfin shiner	16-20	2	0.1	0.05	4	0.4	0.10
	21-25	3	0.5	0.17	1	0.2	0.20
	26-30	1	0.3	0.30	-	-	-
	31-35	4	1.4	0.35	-	-	-
	36-40	3	1.7	0.57	-	-	-
Bluntnose minnow	21-25	1	0.1	0.10		NO FISH TAKEN	
	26-30	1	0.5	0.50			
Purple cusped Tessellated darter	36-40	1	0.7	0.70		NO FISH TAKEN	
	41-45	1	0.7	0.70	-	-	-
	46-50	1	0.9	0.90	1	0.9	0.90
Banded darter	36-40	1	0.7	0.70		NO FISH TAKEN	

* 0.1 means reading was below the accuracy of the scales.

1565 120

POOR ORIGINAL

Table 2.2-82

Length frequency and mean weights per 5 mm group of fishes taken by seine on 30 April 1976 downstream and upstream from the TMINS discharge.

		DOWNSTREAM			UPSTREAM		
Species	Fork Length (5 mm groups)	No.	Total wt. (g)	Mean wt. (g)	No.	Total wt. (g)	Mean wt. (g)
Spottail shiner	51-55	1	1.9	1.90			
	56-60	2	5.0	2.50	NO FISH TAKEN		
	61-65	1	2.8	2.80			
Swallowtail shiner	16-20	-	-	-	1	0.1*	-
	21-25	-	-	-	2	0.4	0.20
	26-30	-	-	-	2	0.5	0.25
	36-40	1	0.6	0.60	2	1.1	0.55
Spotfin shiner	21-25	2	0.2	0.10	3	0.4	0.13
	26-30	1	0.2	0.20	3	0.7	0.23
	36-40	2	1.1	0.55	-	-	-
	41-45	3	2.9	0.97	-	-	-
	46-50	6	8.7	1.47	-	-	-
	51-55	7	13.8	1.90	-	-	-
	56-60	3	6.8	2.27	-	-	-
	61-65	2	6.4	3.20	-	-	-
	66-70	2	8.8	4.40	-	-	-
Bluntnose minnow	26-30	-	-	-	1	0.3	0.30
	56-60	1	2.1	2.10	-	-	-
Smallmouth bass	101-105	1	14.1	14.10	NO FISH TAKEN		
Tessellated darter	36-40	NO FISH TAKEN			1	0.6	0.60
	41-45				4	2.9	0.73

* 0.1 means reading was below the accuracy of the scales.

Table 2.2-83

Length frequency and mean weights per 5 mm group of fishes taken by seine on 10 May 1976 downstream and upstream from the TMINS discharge.

		DOWNSTREAM			UPSTREAM		
Species	Fork Length (5 mm groups)	No.	Total wt. (g)	Mean wt. (g)	No.	Total wt. (g)	Mean wt. (g)
Bluntnose minnow	61-65	1	3.7	3.70	NO FISH TAKEN		
Tessellated darter	41-45	-	-	-	1	0.8	0.80
	51-55	1	1.1	1.10	-	-	-

POOR ORIGINAL

1565 121

Table 2.2-84

Length frequency and mean weights per 5 mm group of fishes taken by seine on 24 May 1976 downstream and upstream from the TMINS Discharge.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Spottail shiner	11-15	1	0.1*	-			
					NO FISH TAKEN		
	61-65	2	6.7	3.35			
	66-70	1	3.6	3.60			
Swallowtail shiner	31-35	NO FISH TAKEN			1	0.5	0.50
Spotfin shiner	21-25	1	0.2	0.20	NO FISH TAKEN		
Creek chub	11-15	1	0.1*	-	NO FISH TAKEN		
	16-20	3	0.2	0.07			
White sucker/	16-20	25	1.3	0.05	NO FISH TAKEN		
Shorthead redhorse	21-25	5	0.4	0.08			
Smallmouth bass	86-90	-	-	-	1	9.0	9.00
	106-110	1	19.8	19.80	-	-	-
	111-115	-	-	-	1	22.8	22.80
	151-155	1	56.2	56.20	-	-	-
Tessellated darter	16-20	1	0.1*	-	NO FISH TAKEN		

* 0.1 means reading was below the accuracy of the scales.

Table 2.2-85

Length frequency and mean weights per 5 mm group of fishes taken by seine on 7 June 1976 downstream and upstream from the TMINS Discharge.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Spottail shiner	6-10	72	0.8	0.01	96	1.0	0.01
	11-15	327	8.5	0.03	265	5.4	0.02
	16-20	16	1.0	0.06	16	0.7	0.04
Swallowtail shiner	36-40	NO FISH TAKEN			1	0.8	0.80
	41-45				1	1.0	1.00
Spotfin shiner	21-25	2	0.4	0.20	-	-	-
	26-30	4	1.0	0.25	-	-	-
	31-35	-	-	-	3	1.3	0.43
	36-40	-	-	-	5	2.8	0.56
	41-45	-	-	-	7	5.8	0.83
	46-50	-	-	-	9	10.4	1.16
	51-55	-	-	-	10	16.8	1.68
Bluntnose minnow	31-35	4	2.0	0.50	NO FISH TAKEN		
Longnose dace	16-20	5	0.4	0.08	1	0.1	0.10
	21-25	4	0.7	0.18	-	-	-
Creek chub	11-15	4	0.2	0.05			
	16-20	5	0.5	0.10	NO FISH TAKEN		
	21-25	7	1.1	0.16			
White sucker/	11-15	147	7.5	0.05	264	4.4	0.02
Shorthead redhorse	16-20	41	2.1	0.05	64	7.2	0.04
	21-25	15	3.8	0.11	5	0.7	0.14
	26-30	29	6.4	0.22	2	0.5	0.25
Redbreast sunfish	51-55	2	6.8	3.40	NO FISH TAKEN		
Bluegill	66-70	1	6.8	6.80	NO FISH TAKEN		
Tessellated darter	11-15	1	0.1*	-	3	0.1	0.03
	16-20	1	0.1	0.10	2	0.1	0.05
	21-25	1	0.1	0.10	-	-	-
Shield darter	6-10	-	-	-	1	0.1*	-
	11-15	2	0.1*	-	14	0.4	0.03

* 0.1 means reading was below the accuracy of the scales.

POOR ORIGINAL

1565 122

Table 2.2-86

Length frequency and mean weights per 5 mm group of fishes taken by seine on 21 June 1976 downstream and upstream from the TMINS Discharge.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Comely shiner	11-15	-	-	-	3	0.1	0.03
	16-20	1	0.1*	-	-	-	-
					3	0.1*	-
Spottail shiner	6-10	-	-	-	-	-	-
	11-15	47	1.3	0.03	51	1.5	0.03
	16-20	106	7.1	0.07	67	4.7	0.07
	21-25	110	14.8	0.13	47	8.9	0.13
	26-30	14	3.1	0.22	12	2.4	0.20
Spottin shiner	16-20	1	0.1	0.10	-	-	-
	21-25	1	0.2	0.20	-	-	-
	31-35	2	0.7	0.35	1	0.5	0.50
	36-40	4	2.0	0.50	5	3.0	0.60
	41-45	5	4.7	0.94	1	1.0	1.00
	46-50	3	4.4	1.47	1	1.5	1.50
	51-55	2	3.6	1.80	1	1.7	1.70
	56-60	-	-	-	1	2.9	2.90
	76-80	1	6.1	6.10	-	-	-
Blacknose dace	21-25	NO FISH TAKEN			1	0.1	0.10
Longnose dace	21-25	NO FISH TAKEN			1	0.1	0.10
Creek chub	21-25	1	0.2	0.20	2	0.4	0.20
	26-30	5	1.5	0.30	-	-	-
	31-35	13	6.4	0.49	-	-	-
	36-40	2	1.2	0.60	-	-	-
	56-60	1	2.8	2.80	-	-	-
White sucker	31-35	-	-	-	1	0.4	0.40
	41-45	1	1.2	1.20	-	-	-
Shorthead redhorse	16-20				8	0.5	0.06
	21-25	NO FISH TAKEN			6	0.8	0.13
	26-30				2	0.8	0.40
White sucker/ Shorthead redhorse	11-15	2	0.1	0.05	-	-	-
	16-20	19	1.1	0.06	3	0.2	0.07
	21-25	2	0.3	0.15	1	0.1	0.10
	26-30	2	0.6	0.30	-	-	-
	31-35	2	0.7	0.35	-	-	-
Smallmouth bass	16-20	1	0.1	0.10	NO FISH TAKEN		
Tessellated darter	11-15	-	-	-	1	0.1*	-
	16-20	-	-	-	2	0.1	0.05
	21-25	1	0.2	0.20	9	1.2	0.13
	26-30	6	1.4	0.23	10	1.9	0.19
	31-35	-	-	-	1	0.3	0.30
Shield darter	6-10	NO FISH TAKEN			1	0.1*	-
	11-15				1	0.1*	-

Table 2.2-87

Length frequency and mean weights per 5 mm group of fishes taken by seine on 7 July 1976 downstream and upstream from the TMINS Discharge.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Comely shiner	11-15				2	0.2	0.06
	16-20	NO FISH TAKEN			8	0.6	0.08
	21-25				10	1.0	0.10
Common shiner	36-40	NO FISH TAKEN			1	0.6	0.60
Spottail shiner	11-15	6	0.4	0.07	17	0.6	0.04
	16-20	168	11.8	0.07	83	5.6	0.07
	21-25	184	22.6	0.12	70	8.6	0.12
	26-30	46	9.7	0.21	28	5.7	0.20
	31-35	4	1.7	0.43	2	0.6	0.30
	36-40	2	1.1	0.55	-	-	-
Spottin shiner	11-15	-	-	-	1	0.1*	-
	16-20	-	-	-	2	0.2	0.10
	31-35	-	-	-	1	0.6	0.60
	36-40	1	0.8	0.80	9	5.8	0.64
	41-45	-	-	-	11	10.4	0.80
	46-50	-	-	-	5	5.4	1.08
	51-55	-	-	-	1	1.5	1.75
	56-60	-	-	-	1	2.4	2.40
	71-75	1	5.3	5.30	-	-	-
Stonecat minnow	16-20	-	-	-	2	0.2	0.10
	61-65	1	2.9	2.90	-	-	-
Blacknose dace	51-55	NO FISH TAKEN			1	1.7	1.70
Fallfish	31-35	2	1.3	0.65	-	-	-
	36-40	4	3.2	0.80	1	1.0	1.00
	41-45	7	7.0	1.00	-	-	-
	46-50	2	2.4	1.20	-	-	-
White sucker	16-20	3	0.4	0.13			
	21-25	5	1.0	0.20			
	26-30	16	4.4	0.28			
	31-35	64	27.9	0.44			
	36-40	51	27.2	0.53	NO FISH TAKEN		
	41-45	8	8.2	1.03			
	46-50	7	10.0	1.43			
	56-60	1	2.5	2.50			
Northern hog sucker	26-30	NO FISH TAKEN			1	0.4	0.40
White sucker/ Shorthead redhorse	16-20	1	0.1	0.10	2	0.2	0.10
	21-25	4	0.8	0.20	3	0.6	0.20
	26-30	-	-	-	5	1.4	0.28
	31-35	1	0.4	0.40	-	-	-
Brown bullhead	26-30	2	0.7	0.35	NO FISH TAKEN		
	31-35	2	1.0	0.50			

POOR ORIGINAL

1565 123

Table 2.2-87 continued.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Channel catfish	16-20	3	0.4	0.13	NO FISH TAKEN		
	21-25	9	1.6	0.18			
Rock bass	6-10	NO FISH TAKEN			1	0.1*	-
Smallmouth bass	16-20	-	-	-	2	0.4	0.20
	21-25	1	0.3	0.30	5	1.0	0.20
	26-30	6	2.1	0.35	5	1.6	0.32
	31-35	1	0.7	0.70	1	0.5	0.50
	46-50	-	-	-	1	2.0	2.00
	56-60	2	5.6	1.80	-	-	-
White crappie	21-25	1	0.2	0.20	NO FISH TAKEN		
	26-30	2	0.7	0.35			
Tessellated darter	16-20	-	-	-	4	6.8	0.20
	21-25	2	0.3	0.15	5	0.9	0.18
	26-30	9	2.1	0.23	-	-	-
	31-35	6	1.8	0.30	2	0.6	0.30
Banded darter	21-25	NO FISH TAKEN			2	0.2	0.10

* 0.1 means reading was below the accuracy of the scales.

Table 2.2-88

Length frequency and mean weights per 5 mm group of fishes taken by seine on 19 July 1976 downstream and upstream from the TMINS Discharge.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Carp	41-45	1	2.0	2.00	NO FISH TAKEN		
Comely shiner	26-30	1	0.2	0.20	7	1.6	0.23
	31-35	1	0.4	0.40	-	-	-
Common shiner	21-25				2	0.3	0.15
	26-30	NO FISH TAKEN			3	0.9	0.30
	36-40				1	0.8	0.80
Spottail shiner	16-20	7	0.6	0.09	10	0.9	0.09
	21-25	28	3.9	0.14	75	10.2	0.14
	26-30	60	14.2	0.24	95	22.0	0.23
	31-35	41	14.9	0.36	39	13.8	0.35
	36-40	11	6.8	0.62	7	4.1	0.59
	41-45	-	-	-	2	1.8	0.90
Spotfin shiner	36-40	-	-	-	3	2.0	0.67
	41-45	1	0.7	0.70	17	14.1	0.83
	46-50	2	2.8	1.40	18	21.0	1.17
	51-55	1	1.7	1.70	10	17.6	1.76
	61-65	-	-	-	1	2.9	2.90
	71-75	1	2.9	2.90	1	4.9	4.90
Bluntnose minnow	16-20	1	0.1*	-	-	-	-
	26-30	-	-	-	1	0.3	0.30
	31-35	-	-	-	1	0.5	0.50
	46-50	1	1.9	1.90	-	-	-
	56-60	1	2.2	2.20	-	-	-
Blacknose dace	26-30	NO FISH TAKEN			1	0.3	0.30
Creek chub	36-40	1	0.7	0.70	NO FISH TAKEN		
Fallfish	46-50	1	1.5	1.50	2	2.9	1.45
	51-55	-	-	-	1	1.7	1.70
Quillback	41-45	NO FISH TAKEN			1	1.7	1.70

POOR ORIGINAL

1565 124

Table 2.2-88 continues.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
White sucker	26-30	1	0.3	0.30	-	-	-
	31-35	-	-	-	1	0.6	0.60
	36-40	5	3.3	0.66	4	2.9	0.73
	41-45	5	5.0	1.00	1	1.1	1.10
	46-50	2	2.5	1.25	1	1.1	1.10
Shorthead redhorse	26-30	1	0.3	0.30	2	0.7	0.35
	31-35	10	4.5	0.45	1	0.4	0.40
	36-40	12	7.5	0.63	2	1.2	0.60
	41-45	5	4.2	0.84	2	2.1	1.05
	46-50	1	1.2	1.20	-	-	-
Brown bullhead	31-35	1	0.5	0.50			
	41-45	2	2.3	1.15	NO FISH TAKEN		
Rock bass	16-20	NO FISH TAKEN			1	0.2	0.20
Redbreast sunfish	56-60	1	4.1	4.10	NO FISH TAKEN		
Pumpkinseed	86-90	NO FISH TAKEN			1	13.3	13.30
Smallmouth bass	26-30	-	-	-	1	0.5	0.50
	36-40	-	-	-	2	1.5	0.75
	41-45	1	1.3	1.30	4	4.5	1.13
	46-50	1	1.5	1.50	-	-	-
	61-65	-	-	-	1	3.5	3.50
	66-70	1	4.6	4.60	-	-	-
	71-75	-	-	-	1	5.3	5.30
	76-80	2	14.9	7.45	-	-	-
Largemouth bass	41-45	NO FISH TAKEN			1	1.0	1.00
Tessellated darter	16-20	-	-	-	1	0.1	0.10
	21-25	1	0.2	0.20	1	0.1	0.10
	26-30	2	0.5	0.25	5	1.0	0.20
	31-35	10	3.0	0.30	2	0.5	0.25
	41-45	1	0.6	0.60	-	-	-
Banded darter	26-30	NO FISH TAKEN			1	0.3	0.30

* 0.1 means reading was below the accuracy of the scales.

Table 2.2-89

Length frequency and mean weights per 5 mm group of fishes taken by seine on 2 August 1976 downstream and upstream from the TMINC Discharge.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Comely shiner	41-45	NO FISH TAKEN			1	0.8	0.80
Common shiner	26-30				4	1.3	0.33
	31-35	NO FISH TAKEN			3	1.6	0.53
	36-40				1	0.7	0.70
Spottail shiner	21-25	2	0.5	0.25	4	0.8	0.20
	26-30	11	3.0	0.27	43	11.5	0.27
	31-35	36	15.3	0.43	43	17.7	0.41
	36-40	18	11.7	0.65	24	14.4	0.60
	41-45	4	3.6	0.90	2	1.7	0.85
Spotfin shiner	51-55	NO FISH TAKEN			1	1.8	1.80
Bluntnose minnow	21-25	2	0.3	0.15	1	0.2	0.20
	26-30	1	0.3	0.30	6	1.5	0.25
	31-35	1	0.5	0.50	-	-	-
	36-40	1	0.6	0.60	-	-	-
Fallfish	41-45	NO FISH TAKEN			2	2.3	1.15
	46-50				1	1.6	1.60
White sucker	41-45	3	3.3	1.10	1	1.2	1.20
	46-50	2	2.6	1.30	-	-	-
	56-60	1	2.5	2.50	-	-	-
	61-65	1	3.3	3.30	-	-	-
Northern hog sucker	41-45	1	1.0	1.00	NO FISH TAKEN		
Shorthead redhorse	31-35	1	0.4	0.40	2	1.2	0.60
	36-40	5	3.7	0.74	-	-	-
	41-45	3	3.2	1.07	2	1.8	0.90
	46-50	1	1.2	1.20	-	-	-
Yellow bullhead	26-30	1	0.4	0.40	NO FISH TAKEN		
	31-35	1	0.5	0.50			
Brown bullhead	41-45	2	2.1	1.05	NO FISH TAKEN		
Channel catfish	21-25	3	0.7	0.23			
	26-30	16	4.8	0.30			
	31-35	51	25.8	0.51	NO FISH TAKEN		
	36-40	29	18.6	0.64			
	41-45	3	2.7	0.90			
	46-50	1	1.2	1.20			

POOR ORIGINAL

1565 125

Table 7.2-89 continued.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Redbreast sunfish	16-20	NO FISH TAKEN			1	0.1*	-
Smallmouth bass	36-40	2	2.2	1.10	-	-	-
	41-45	1	1.3	1.30	1	1.2	1.20
	51-55	2	4.0	2.00	-	-	-
	61-65	2	7.7	3.85	1	3.5	3.50
	66-70	1	4.9	4.90	-	-	-
	76-80	-	-	-	1	7.2	7.20
White crappie	26-30	1	0.3	0.30	NO FISH TAKEN		
Tessellated darter	26-30	-	-	-	3	0.7	0.23
	31-35	15	4.5	0.30	10	2.7	0.27
	36-40	12	5.8	0.48	13	5.5	0.42
	41-45	4	2.3	0.58	2	1.2	0.60

* 0.1 means reading was below the accuracy of the scales.

Table 7.2-90

Length frequency and mean weights per 5 mm group of fishes taken by seine on 16 August 1976 downstream and upstream from the EMF-2 discharge.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
River chub	46-50	-	-	-	1	1.5	1.50
	51-55	1	2.3	2.30	-	-	-
Comely shiner	21-25	1	0.2	0.20	-	-	-
	26-30	-	-	-	2	0.6	0.30
	46-50	-	-	-	2	2.1	1.05
Common shiner	26-30	1	0.3	0.30	-	-	-
	31-35	-	-	-	5	2.4	0.48
	36-40	-	-	-	2	1.6	0.80
	41-45	-	-	-	2	1.8	0.90
Spottail shiner	26-30	1	0.4	0.40	7	2.2	0.31
	31-35	7	3.0	0.43	14	6.3	0.45
	36-40	23	15.8	0.69	26	17.0	0.65
	41-45	29	28.0	0.97	18	16.4	0.91
	46-50	27	25.5	0.94	10	13.4	1.34
	51-55	7	11.8	1.69	1	2.0	2.00
	91-95	1	11.0	11.00	-	-	-
Swallowtail shiner	26-30				1	0.4	0.40
	46-50	NO FISH TAKEN			1	1.5	1.50
Spotfin shiner	16-20	8	0.6	0.08	3	0.3	0.10
	21-25	5	0.7	0.14	4	0.6	0.15
	26-30	1	0.3	0.30	19	4.7	0.25
	31-35	-	-	-	7	2.8	0.40
	36-40	-	-	-	1	0.5	0.50
	46-50	1	1.5	1.50	1	1.1	1.10
	51-55	1	1.7	1.70	-	-	-
	56-60	1	2.5	2.50	-	-	-
	61-65	1	7.9	2.63	-	-	-
Bluntnose minnow	21-25	4	0.7	0.18	1	0.2	0.20
	26-30	14	3.3	0.24	2	0.7	0.35
	31-35	5	1.7	0.34	1	0.5	0.50
	36-40	1	0.8	0.80	1	0.7	0.70
	41-45	-	-	-	2	1.9	0.95
	46-50	1	1.5	1.50	-	-	-
	51-55	-	-	-	1	2.0	2.00

POOR ORIGINAL

1565 126

Table 2.2-90 continued.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Fallfish	51-55	2	4.4	2.20	NO FISH TAKEN		
White sucker	51-55	1	1.7	1.70	NO FISH TAKEN		
Shorthead redhorse	36-40	1	0.9	0.90	-	-	-
	41-45	-	-	-	1	1.0	1.00
	46-50	6	7.8	1.30	-	-	-
	51-55	2	3.3	1.65	1	2.0	2.00
	56-60	1	2.5	2.50	-	-	-
Rock bass	31-35	NO FISH TAKEN			2	1.6	0.80
	36-40				1	1.0	1.00
Redbreast sunfish	86-90	1	13.0	13.00	NO FISH TAKEN		
Pumpkinseed	71-75	1	7.6	7.60	NO FISH TAKEN		
Bluegill	26-30	2	0.9	0.45	1	0.4	0.40
Smallmouth bass	36-40	1	1.0	1.00	-	-	-
	46-50	2	3.1	1.55	1	1.8	1.80
	51-55	2	4.3	2.15	1	2.0	2.00
	61-65	2	7.0	3.50	-	-	-
White crappie	31-35	8	3.8	0.48	-	-	-
	36-40	8	4.9	0.61	-	-	-
	41-45	4	3.5	0.88	-	-	-
	46-50	2	2.3	1.15	1	1.2	1.20
Black crappie	46-50	NO FISH TAKEN			1	1.7	1.70
	56-60				1	2.7	2.70
Tessellated darter	26-30	1	0.2	0.20	2	0.4	0.20
	31-35	18	5.1	0.28	3	0.9	0.30
	36-40	39	16.0	0.41	4	1.8	0.45
	41-45	14	8.0	0.57	-	-	-
	46-50	2	1.8	0.90	-	-	-

Table 2.2-91

Length frequency and mean weights per 5 mm group of fishes taken by seine on 1 September 1976 downstream and upstream from the TMI-2 discharge.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Cutlips minnow	41-45	1	1.0	1.00	NO FISH TAKEN		
River chub	51-55	1	1.9	1.90	NO FISH TAKEN		
Golden shiner	51-55	NO FISH TAKEN			1	1.6	1.60
Comely shiner	31-35	2	0.7	0.35	-	-	-
	36-40	-	-	-	1	0.5	0.50
Common shiner	36-40	NO FISH TAKEN			4	2.7	0.68
	41-45				3	2.7	0.90
Spottail shiner	31-35	-	-	-	1	0.7	0.70
	36-40	6	4.1	0.68	45	30.1	0.67
	41-45	18	15.6	0.87	34	39.8	1.17
	46-50	8	10.0	1.25	20	24.4	1.22
	51-55	6	9.0	1.50	12	19.7	1.64
	56-60	1	2.2	2.20	5	10.5	2.10
Swallowtail shiner	26-30				1	0.2	0.20
	31-35				3	1.1	0.37
	36-40	NO FISH TAKEN			1	0.5	0.50
	41-45				1	1.0	1.00
	46-50				1	1.2	1.20
	51-55				1	1.5	1.50
Spotfin shiner	11-15	-	-	-	18	0.5	0.03
	16-20	-	-	-	17	0.7	0.04
	21-25	9	1.3	0.14	39	5.1	0.13
	26-30	19	4.3	0.23	63	14.5	0.23
	31-35	5	1.7	0.34	38	14.4	0.38
	36-40	3	1.8	0.60	12	6.6	0.55
	41-45	-	-	-	1	0.8	0.80
	61-65	1	2.1	2.10	-	-	-
Bluntnose minnow	21-25	1	0.2	0.20	-	-	-
	26-30	1	0.3	0.30	-	-	-
	31-35	1	0.5	0.50	2	1.0	0.50
	36-40	4	2.6	0.65	1	0.8	0.80
Creek chub	46-50	NO FISH TAKEN			1	1.7	1.70
White sucker	41-45	1	0.8	0.80	-	-	-
	56-60	1	2.5	2.50	-	-	-
	66-70	-	-	-	1	4.0	4.00
	71-75	-	-	-	1	5.0	5.00
	76-80	-	-	-	2	12.3	6.15

POOR ORIGINAL

1565 127

Table 2.2-91 continued.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Northern hog sucker	61-65	NO FISH TAKEN			1	2.7	2.70
	66-70				1	3.7	3.70
Shorthead redhorse	46-50	-	-	-	1	1.3	1.30
	51-55	2	3.9	1.95	1	1.9	1.90
	56-60	1	2.5	2.50	-	-	-
	61-65	1	3.3	3.30	-	-	-
White catfish	56-60	1	2.9	2.90	NO FISH TAKEN		
Channel catfish	26-30	1	0.4	0.40			
	31-35	3	1.3	0.43			
	36-40	2	1.5	0.75			
	41-45	9	8.7	0.97			
	46-50	57	73.7	1.29	NO FISH TAKEN		
	51-55	43	70.8	1.64			
	56-60	8	17.7	2.21			
	61-65	2	4.9	2.45			
	66-70	1	3.4	3.40			
	71-75	1	3.9	3.90			
Pumpkinseed	41-45	NO FISH TAKEN			1	1.5	1.50
Bluegill	21-25	1	0.1	0.10	NO FISH TAKEN		
Smallmouth bass	41-45				1	1.2	1.20
	56-60				1	2.9	2.90
	66-70	NO FISH TAKEN			1	3.9	3.90
	91-95				1	12.0	12.00
Black crappie	51-55				1	2.2	2.20
	56-60	NO FISH TAKEN			1	3.1	3.10
	66-70				2	8.5	4.25
Tessellated darter	31-35	3	1.0	0.33	2	0.7	0.35
	36-40	4	2.0	0.50	12	5.2	0.43
	41-45	14	8.3	0.59	13	7.2	0.55
	46-50	4	2.7	0.68	4	3.3	0.83

Table 2.2-92

Length frequency and mean weights per 5 mm group of fishes taken by seine on 13 September 1976 downstream and upstream from the PWRS Discharge.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Comely shiner	21-25	1	0.2	0.20	-	-	-
	26-30	-	-	-	1	0.3	0.30
	41-45	-	-	-	1	0.6	0.60
	46-50	-	-	-	1	1.0	1.00
	51-55	-	-	-	3	3.9	1.30
	56-60	-	-	-	2	4.1	2.05
	61-65	-	-	-	1	2.2	2.20
Common shiner	46-50	NO FISH TAKEN			1	1.4	1.40
Spottail shiner	36-40	-	-	-	2	1.6	0.80
	41-45	8	7.6	0.95	8	7.6	0.95
	46-50	8	10.1	1.26	14	17.4	1.24
	51-55	4	5.6	1.40	11	19.1	1.74
	56-60	1	2.4	2.40	5	10.8	2.16
	61-65	2	5.6	2.80	2	5.8	2.90
Spottin shiner	16-20	1	0.1*	-	1	0.1*	-
	21-25	6	1.1	0.18	12	1.6	0.13
	26-30	9	2.3	0.26	12	2.9	0.24
	31-35	4	1.3	0.33	7	2.9	0.41
	36-40	-	-	-	9	5.2	0.58
	41-45	-	-	-	4	3.4	0.85
	46-50	-	-	-	1	1.4	1.40
	61-65	-	-	-	3	8.9	2.97
Blunthose minnow	21-25	1	0.2	0.20	2	0.3	0.15
	26-30	-	-	-	4	0.9	0.23
	31-35	1	0.5	0.50	1	0.3	0.30
	36-40	1	0.6	0.60	1	0.7	0.70
	41-45	-	-	-	7	6.7	0.96
	46-50	-	-	-	1	1.1	1.10
Shorthead redhorse	56-60	NO FISH TAKEN			2	4.7	2.35

POOR ORIGINAL

1565 128

Table 2.2-92 continued.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Channel catfish	31-35	2	1.1	0.55	-	-	-
	36-40	7	4.8	0.69	-	-	-
	41-45	21	21.6	1.03	-	-	-
	46-50	20	27.4	1.37	-	-	-
	51-55	24	41.6	1.73	1	1.7	1.70
	56-60	12	26.5	2.21	1	2.0	2.00
	61-65	1	3.2	3.20	-	-	-
Rock bass	41-45	NO FISH TAKEN			1	1.9	1.90
Redbreast sunfish	31-35	1	3.1	3.10	NO FISH TAKEN		
Pumpkinseed	21-25	1	0.3	0.30	NO FISH TAKEN		
Bluegill	21-25	1	0.2	0.20	-	-	-
	41-45	-	-	-	1	1.3	1.30
Smallmouth bass	56-60	1	3.2	3.20	1	2.8	2.80
	61-65	1	3.5	3.50	-	-	-
Tessellated darter	36-40	3	1.6	0.53	-	-	-
	41-45	10	6.6	0.66	30	17.8	0.59
	46-50	5	3.9	0.78	12	9.8	0.82
Banded darter	26-30	NO FISH TAKEN			1	0.3	0.30

* 0.1 means reading was below the accuracy of the scales.

Table 2.2-93

Length frequency and mean weights per 5 mm group of fishes taken by seine on 29 September 1976 downstream and upstream from the TMINS Discharge.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Comely shiner	26-30	NO FISH TAKEN			1	0.2	0.20
Spottail shiner	36-40	1	0.9	0.90	-	-	-
	41-45	2	2.0	1.00	2	2.4	1.20
	46-50	5	6.3	1.26	2	2.4	1.20
	51-55	3	4.8	1.60	3	5.5	1.83
	56-60	4	9.2	2.30	5	10.4	2.08
	61-65	5	15.9	2.98	-	-	-
Swallowtail shiner	16-20	1	0.1	0.10	-	-	-
	31-35	-	-	-	2	0.9	0.45
Spotfin shiner	11-15	25	0.7	0.03	11	0.2	0.02
	16-20	80	4.7	0.06	30	1.7	0.06
	21-25	125	16.5	0.13	46	5.2	0.11
	26-30	45	9.8	0.22	10	2.0	0.20
	31-35	3	1.0	0.33	2	0.9	0.45
	76-80	-	-	-	1	6.0	6.00
Bluntnose minnow	16-20	2	0.1	0.05	-	-	-
	21-25	3	0.4	0.13	-	-	-
	26-30	4	0.7	0.18	-	-	-
	36-40	3	1.6	0.53	-	-	-
	41-45	2	2.0	1.00	-	-	-
	46-50	1	1.1	1.10	1	1.5	1.50
	51-55	-	-	-	2	3.8	1.90
	56-60	1	2.1	2.10	-	-	-
Creek chub	66-70	NO FISH TAKEN			1	3.9	3.90

POOR ORIGINAL

1565 129

Table 2.2-93 continued.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Fallfish	66-70	1	3.9	3.90			
					NO FISH TAKEN		
	81-85	1	6.5	6.50			
Shorthead redhorse	56-60	1	1.9	1.90	NO FISH TAKEN		
	61-65	1	3.0	3.00			
Channel catfish	46-50	2	3.1	1.55	-	-	-
	51-55	5	8.8	1.76	-	-	-
	71-75	-	-	-	1	4.5	4.50
Redbreast sunfish	41-45	1	1.6	1.60	NO FISH TAKEN		
Pumpkinseed	36-40	1	0.9	0.90	NO FISH TAKEN		
Bluegill	61-65	1	4.5	4.50	NO FISH TAKEN		
Smallmouth bass	61-65	1	3.5	3.50			
	66-70	1	4.7	4.70	NO FISH TAKEN		
	91-95	1	10.0	10.00			
Tessellated darter	36-40	4	2.0	0.50	2	1.0	0.50
	41-45	16	11.1	0.69	6	3.9	0.65
	46-50	49	41.4	0.84	10	8.3	0.83
	51-55	13	14.1	1.08	7	7.9	1.13
	56-60	3	4.3	1.43	-	-	-
Banded darter	31-35				3	1.2	0.40
	36-40	NO FISH TAKEN			6	3.1	0.52
	41-45				2	1.4	0.70

Table 2.2-94

Length frequency and mean weights per 5 mm group of fishes taken by seine on 19 October 1976 downstream and upstream from the TMNS Discharge.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Comely shiner	56-60	NO FISH TAKEN			1	2.0	2.00
Common shiner	46-50	NO FISH TAKEN			2	2.8	1.40
Spottail shiner	36-40	2	2.0	1.00	-	-	-
	41-45	6	6.8	1.13	4	3.7	0.93
	46-50	6	9.8	1.63	6	6.6	1.15
	51-55	5	9.1	1.82	9	14.3	1.59
	56-60	1	2.7	2.70	7	14.4	2.06
	61-65	5	14.1	2.82	2	5.2	2.60
	66-70	-	-	-	1	3.2	3.20
Swallowtail shiner	21-25	5	0.6	0.12	-	-	-
	26-30	1	0.2	0.20	-	-	-
	31-35	4	1.8	0.45	2	1.0	0.50
	36-40	3	1.7	0.57	1	0.6	0.60
	41-45	2	1.6	0.80	1	0.9	0.90
Rosy Ice shiner	56-60	NO FISH TAKEN			1	1.9	1.90
Spot.in shiner	16-20	6	0.5	0.08	4	0.3	0.08
	21-25	41	5.5	0.13	1	0.2	0.20
	26-30	51	11.2	0.22	-	-	-
	31-35	30	10.5	0.35	-	-	-
	36-40	21	10.9	0.52	2	1.2	0.60
	41-45	6	4.3	0.72	2	1.9	0.95
	46-50	2	2.0	1.00	-	-	-
	56-60	1	2.0	2.00	-	-	-
Bluntnose minnow	26-30	2	0.5	0.25	1	0.4	0.40
	31-35	3	1.2	0.40	1	0.5	0.50
	36-40	5	3.4	0.68	3	2.1	0.70
	41-45	6	5.2	0.87	10	9.0	0.90
	46-50	1	1.4	1.40	7	8.7	1.24
	51-55	1	1.7	1.70	1	1.4	1.40
	56-60	2	4.2	2.10	1	1.9	1.90
	61-65	1	2.3	2.30	-	-	-

1565 130

POOR ORIGINAL

Table 2.2-94 continued.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Fathead minnow	36-40	1	0.8	0.80	NO FISH TAKEN		
Lalifish	71-75	1	4.9	4.90	NO FISH TAKEN		
Rock bass	56-60	1	4.6	4.60	NO FISH TAKEN		
Pumpkinseed	31-35	1	0.6	0.60	NO FISH TAKEN		
Smallmouth bass	56-60	-	-	-	1	3.3	3.30
	66-70	-	-	-	1	5.2	5.20
	71-75	1	6.0	6.00	-	-	-
Tessellated darter	31-35	3	1.1	0.37	1	0.5	0.50
	36-40	4	2.1	0.53	4	2.0	0.50
	41-45	15	9.6	0.64	14	8.6	0.61
	46-50	30	24.8	0.83	24	20.6	0.86
	51-55	17	17.6	1.04	10	12.3	1.23
	56-60	4	5.5	1.38	1	1.7	1.70
Banded darter	21-25	1	0.2	0.20	-	-	-
	31-35	-	-	-	1	0.5	0.50
	36-40	-	-	-	2	1.2	0.60

Table 2.2-95

Length frequency and mean weights per 5 mm group of fishes taken by seine on 25 October 1976 downstream and upstream from the TMINS discharge.

Species	Fork Length (5 mm groups)	DOWNSTREAM No.	DOWNSTREAM Total wt. (g)	DOWNSTREAM Mean wt. (g)	UPSTREAM No.	UPSTREAM Total wt. (g)	UPSTREAM Mean wt. (g)
Comely shiner	51-55	3	4.5	1.50	-	-	-
	56-60	4	7.4	1.85	1	1.8	1.80
	61-65	3	6.8	2.27 *	3	7.1	2.37
Common shiner	86-90	NO FISH TAKEN			1	8.5	8.50
Spottail shiner	36-40	2	1.5	0.75	-	-	-
	41-45	9	8.7	0.97	-	-	-
	46-50	29	37.1	1.28	6	7.0	1.17
	51-55	42	65.9	1.57	15	24.4	1.63
	56-60	22	46.0	2.09	16	36.6	2.29
	61-65	28	74.0	2.64	27	74.5	2.76
	66-70	8	26.7	3.34	8	27.9	3.49
Swallowtail shiner	16-20	-	-	-	2	0.2	0.10
	21-25	-	-	-	2	0.3	0.15
	26-30	1	0.3	0.30	1	0.3	0.30
	31-35	6	2.5	0.42	3	1.2	0.40
	36-40	4	2.2	0.55	2	1.2	0.60
Rosyface shiner	51-55	NO FISH TAKEN			3	4.4	1.47
	56-60				2	3.6	1.80
Spotfin shiner	11-15	-	-	-	11	0.4	0.04
	16-20	1	0.1*	-	67	3.8	0.06
	21-25	17	2.4	0.14	41	4.9	0.12
	26-30	11	2.2	0.20	11	2.1	0.19
	31-35	18	6.8	0.38	2	0.9	0.45
	36-40	12	6.4	0.53	-	-	-
	41-45	6	5.1	0.85	2	2.0	1.00
	46-50	2	2.1	1.05	-	-	-
	51-55	1	1.5	1.50	-	-	-
	61-65	-	-	-	1	2.9	2.90
	66-70	1	3.9	3.90	-	-	-
Bluntnose minnow	21-25	1	0.2	0.20	-	-	-
	36-40	1	0.9	0.90	-	-	-
	41-45	2	2.1	1.05	3	2.8	0.93
	61-65	-	-	-	1	2.7	2.70
Quillback	91-95	1	13.9	13.90	NO FISH TAKEN		
Redbreast sunfish	36-40	1	1.0	1.00	NO FISH TAKEN		
Pumpkinseed	96-100	NO FISH TAKEN			1	22.1	22.10
Bluegill	26-30	NO FISH TAKEN			1	0.5	0.50
Smallmouth bass	86-90	1	10.7	10.70	-	-	-
	111-115	-	-	-	1	22.4	22.40
Tessellated darter	31-35	1	0.2	0.20	-	-	-
	36-40	5	2.3	0.46	2	0.9	0.45
	41-45	20	11.5	0.58	2	1.5	0.75
	46-50	13	10.5	0.81	5	4.2	0.84
	51-55	3	3.3	1.10	5	6.2	1.24

* 0.1 means reading was below the accuracy of the scales.

POOR ORIGINAL

1565 131

POOR ORIGINAL

Table 2.3-1

Summary of number of specimens, number of species, number of collections, and number per collection of fishes taken by trapnet and seine upstream and downstream from the TMINS Discharge during 1974 through 1976.

		Number of Specimens	Number of Species	Number of Collections	Number per Collection
TRAPNET					
	1974	713	19	36	19.81
Upstream	1975	324	20	51	6.35
	1976	295	19	36	8.19
	1974	1257	20	72	17.46
Downstream	1975	1286	21	87	14.78
	1976	527	24	108	4.88
	1974	1970	22	108	18.24
Total	1975	1610	22	138	11.67
	1976	822	25	144	5.71
SEINE					
	1974	3460	24	28	123.57
Upstream	1975	1558	24	30	51.93
	1976	4914	30	36	136.50
	1974	5127	28	45	113.93
Downstream	1975	5016	29	45	111.47
	1976	5564	31	54	103.04
	1974	8587	30	73	117.63
Total	1975	6574	30	75	87.65
	1976	10478	35	90	116.42

1565 132

POOR ORIGINAL

Table 2.3-2

Kendall-tau correlation coefficients for species composition at trapnet and seine stations during 1974-1975, 1974-1976, and 1975-1976.

	1974-1975	1974-1976	1975-1976
TRAPNET			
1A3	0.65	0.47	0.47
11A2	0.69	0.59	0.70
11A3	0.59	0.35	0.48
9B2	0.62	0.57	0.51
SEINE			
1A2	0.55	0.40	0.22*
16A1	0.60	0.42	0.44
10A2	0.57	0.25	0.26
9A1	0.37	0.34	0.26*
9B3	0.61	0.52	0.37

*Significant at 95% level.

1565 133

POOR ORIGINAL

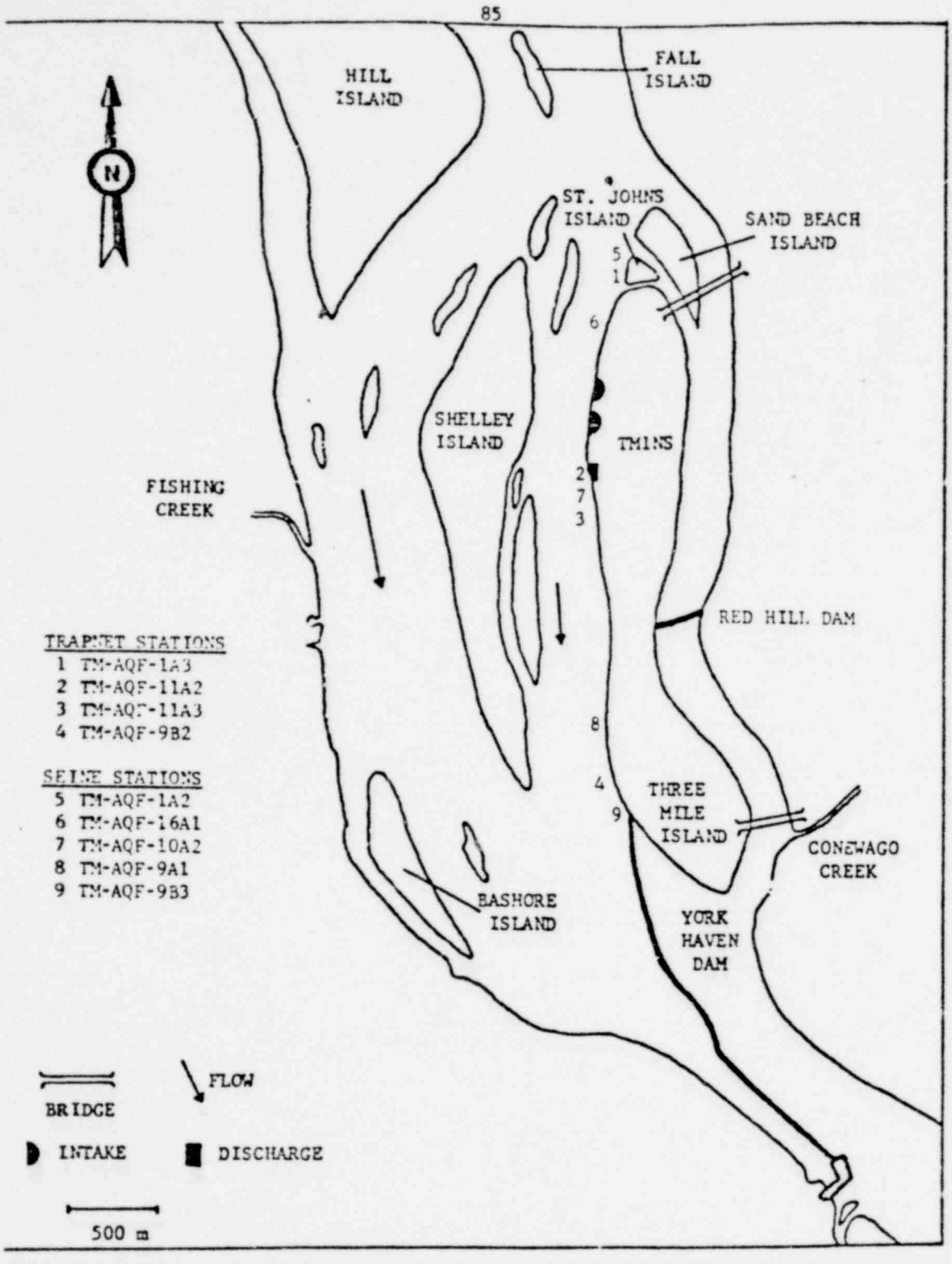

Figure 2.1-1. Location of trapnet and seine stations in the vicinity of TMINS.

1565 134

POOR ORIGINAL

3.0 MACROINVERTEBRATES

The ETS Section 4.1.1E requires semimonthly samples to be taken at five stations in the vicinity of TMINS April through October. Replicate samples were taken both inside and outside of the thermal plume.

3.1 METHODS

Location and description of macroinvertebrate sampling stations are given in Table 3.1-1 and Figure 3.1-1. Four quantitative samples were taken at each station with a 23 x 23 cm (529 cm^2) Ponar grab sampler. Samples were returned to the lab, washed through U.S. Standard No. 30 mesh screens, and preserved in a mixture of 10% formalin and rose bengal stain. The stain facilitates sorting of macroinvertebrates from the detritus or sediment present in the sample (Mason and Yevich 1967). Macroinvertebrates were sorted from each sample with unaided eye. Oligochaetes and chironomids were re-sorted under a stereo microscope (10X-15X). Many oligochaetes were damaged when the samples were washed; those with a complete anterior end were counted. Every tenth Limnodrilus picked from the sample was selected for species determination. Tubificid worms used for identification were cleared in Amman's lactophenol and mounted on microscope slides in CMC-9 or Hoyer's mounting media. Naidid worms were cleared when mounted directly in CMC-9 or Hoyer's mounting media. Chironomids were cleared in a warm 5 to 10% solution of KOH and mounted on microscope slides in CMC-9 or Hoyer's mounting media.

1565 135

POOR ORIGINAL

Organisms were dried in a drying oven at 55 C for 24 hr, cooled in a desiccator, and weighed to the nearest 0.1 mg on a Mettler H31 balance. Gastropods were decalcified in a 7 to 8 N solution of HCL and pelecypod shells were removed manually prior to weight determinations. Weights were not determined for individuals less than 0.1 mg or those retained for taxonomic purposes.

3.1.1 TAXONOMIC TREATMENT

Specimens were identified to genus or species when possible. For diversity calculations, taxonomic comparisons were made by the number of taxa, where a taxon represents the lowest level to which an organism was identified.

Flatworms (Turbellaria) contract when preserved directly in formalin, which renders species identification difficult. For this report, they were determined to the class Turbellaria. The phyla Nemertinea and Nematoda were treated similarly. Numbers and biomass were not calculated for entoprocts and bryozoans because of their colonial nature.

Identification of oligochaetes is dependent on external and internal organs. Most Enchytraeidae, Naididae, and the tubificids Aulodrilus, Branchiura, Peloscolex, and Limnodrilus udekemianus can be identified by their somatic chaetae (hair-like structures present on all oligochaetes except the order Branchiobdellida) or external structures at all stages in their development. Sexually mature specimens are needed for species identifications of most Limnodrilus, Ilyodrilus, and Tubifex. Limnodrilus was the only tubificid collected possessing only bifurcate crotchet chaetae;

1565 136

POOR ORIGINAL

Ilyodrilus and Tubifex additionally possess capilliform chaetae. All immature tubificids without capilliform chaetae were assumed to be immature Limnodrilus. Of the sexually mature Limnodrilus encountered during the sampling period, 88% were L. hoffmeisteri; immature Limnodrilus were grouped with L. hoffmeisteri for interpretation of data. Immature Ilyodrilus and Tubifex collected were recorded as immature tubificids with capilliform chaetae. For data analysis, these were grouped with I. templetoni and T. tubifex and calculated on a percentage basis from the number of sexually mature specimens collected at each station.

Certain species of earthworms (limicolous) inhabit the margins of streams, ponds, lakes, etc. (Reynolds 1975). Limicolous earthworms encountered unidentifiable to the family Lumbriculidae or Sparganophilidae were recorded as "megadriles" (a term which collectively encompasses many families of earthworms).

Leeches (Hirudinea) contract when preserved directly in formalin, which makes identification difficult. Large, mature specimens are needed for genus and species determinations in the family Erpobdellidae; immature or badly distorted specimens were identified only as Erpobdellidae. Mooreobdella microstoma was the only erpobdellid collected identifiable to species. Individuals of M. microstoma were grouped with Erpobdellidae for diversity calculations.

Numbers of larval and pupal Diptera were combined for data interpretation.

If keys were unavailable or incomplete for species separation in some genera, apparently different species of a genus were given letter designators (i.e., Eukiefferiella sp. A, sp. B, etc.). Some genera or species are

1565 137

POOR ORIGINAL

separable only to groups. The Palpomyia group (Diptera:Ceratopogonidae) contains the genera Bezzia, Probezzia, and Palpomyia, which are inseparable in their larval stages at the present time.

Species identifications in the Chironomidae are difficult. Roback (1976) found many identifications of immatures and adults (by various authors, including himself) were incorrect or nomenclatorially out of date. Major genera and groups constantly undergo revision. Consequently, some specimens identified previously may have been misdetermined.

Misdeterminations in Kennedy (1975) and Polk and Epler (1976) were:

Limnodrilus profundicola (1975, 1976) = L. hoffmeisteri (this report)

Trepobates sp. = Metrobates hesperius

Micropsectra sp. = Tanytarsus sp.

Synonomies from Polk and Epler (1976) are:

Athripsodes = Ceraclea (cf. Morse and Wallace 1975)

Ablabesmyia auriensis = A. mallochi (cf. Roback 1971)

Chironomus attenuatus (as Chironomus sp.) = C. decorus (cf. Sublette and Sublette 1974).

Specimens identified to tribe Tanytarsini in Polk and Epler (1976) were Tanytarsus sp.

Macroinvertebrate taxa found in the Susquehanna River in the vicinity of Three Mile Island are listed in Table 3.1-2. Identification of benthic organisms was aided with keys and descriptions in Beck and Beck (1966), Beck and Beck (1969), Boesel (1974), Brinkhurst and Jamieson (1971), Brown (1972), Burch (1973), Burks (1975), Curry (1958), Edmondson (1959), Foster

1565 138

(1972), Harman and Berg (1971), Hilsenhoff (1975), Hiltunen (1973), Holsinger (1972), Johannsen (1969), Klemm (1972), Mason (1973), Needham and Westfall (1955), Reynolds (1975), Roback (1957, 1974b, 1976), Ross (1972), Saether (1975, 1976), Sawyer (1972), Usinger (1956), Walker (1958), and Walker and Corbet (1975).

3.1.2 DATA ANALYSIS

Densities (number/m^2) were calculated for taxa that comprised more than one percent of the total number of organisms collected. Biomass (mg/m^2) of selected taxa was determined.

Diversity indices are used to analyze community structure. Monthly estimates of diversity (information per individual) as defined by Shannon's formula:

$$D = \sum_{i=1}^{s} n_i/N \log_2 n_i/N$$

were computed for each station using the formula:

$$D = C/N \ (N\log_{10}N - \sum n_i \log_{10} n_i)$$

where D = information per individual, C = 3.321928 (converts $\log_{10}$ to $\log_2$), N = total number of individuals, n_i = total number of individuals in the i^{th} species, s = the number of species in the sample for a station (Lloyd et al. 1968). This index summarizes the number of taxa present and the distribution of individuals among the taxa. Low D values result from a small number of taxa and uneven distribution of individuals. Large numbers of taxa and even distribution of individuals result in high D values.

1565 139

Benthic communities at each station may have similar D values, but differ in species composition. The similarity in species composition between stations was investigated by an index of percent similarity (Whittaker and Fairbanks 1958). This index is expressed as:

$$PSc = 100 - 0.5 \sum |a - b|$$

where PSc is the percent similarity and a and b are the percentages of a species in samples A and B. This is a quantitative measure of the relative similarity of species composition in two samples. The PSc is only an empirical measure and is not an estimate of a statistical parameter of the population from which the samples are drawn. Values range from 0 to 100. A value of 0 indicates the species composition is entirely different and a value of 100 indicates complete similarity between the two samples.

Analysis of variance (ANOVA), randomized block design (Sokal and Rohlf 1969), was performed to compare numbers of taxa between stations and assess changes over time. The Student-Newman-Keuls multirange test (Woolf 1968) was performed if significant differences existed in the ANOVA. The multirange test was designed to specify which sample means ($\bar{y}$) differed significantly from each other.

Changes in populations of Limnodrilus hoffmeisteri for the 1974 through 1976 sample dates were examined; a three-factor ANOVA was used (Sokal and Rohlf 1969). Comparisons were made for years, sample dates, the macroinvertebrate stations, and interactions between these factors. No quantitative data was available for April 1974 at Station 11A2. The ANOVA was performed

1565 140

on data collected from May through October 1974, 1975, and 1976. Numbers of L. profundicola misdetermined in 1974 and 1975 were included with L. hoffmeisteri in the analysis.

The distribution of benthic organisms is clumped rather than random; a logarithmic transformation [$\log_{10}(y+1)$] was used on densities of L. hoffmeisteri for each replicate to normalize the data (Elliot 1971). Logarithmic transformation prevents attention being focused on small variations in numbers which may not be statistically significant (Brinkhurst and Jamieson 1971). The Student-Newman-Keuls multirange test ($P = 0.05$) was employed if differences were indicated.

3.2 RESULTS

Results of April through October macroinvertebrate collections are reported in Tables 3.2-1 through 3.2-35. A total of 90,567 specimens (112 taxa) was taken during 1976 (Table 3.2-36). The three most abundant taxa (84.8% of the specimens) were Limnodrilus hoffmeisteri (65,516 specimens, 72.3%), Chironomus decorus (9,084, 10.0%), and Nais elinguis (2,265, 2.5%). Other taxa that comprised more than 1% of the total were Pisidium sp. (1,646 specimens, 1.8%), Procladius sp. (1,199, 1.3%), Gammarus fasciatus (1,084, 1.2%), L. claparedeianus (1,059, 1.2%), and L. udekemianus (912, 1.0%).

Limnodrilus hoffmeisteri was usually the most abundant organism collected at each station (Table 3.2-36 and Figure 3.2-1). Nais elinguis was most abundant at Station 1A1 in May and Chironomus decorus was most abundant at Station 9B1 in May and at 1A2 in June.

1565 141

The freshwater polychaete, Manayunkia speciosa, was collected for the first time in 1976. M. speciosa has been taken from the Susquehanna River in Conowingo Pond (D. Wahl, Ichthyological Associates, Inc., personal communication). Formerly believed to be rare, recent papers (Hiltunen 1965; Poe and Stefan 1974; Spencer 1976) have shown M. speciosa to be common and abundant (over 45,000/m^2 in Lake Erie) in many areas. Its small size (< 3 mm) probably caused it to be overlooked.

High numbers of the limpet Ferrissia were collected at Stations 1A1 and 1A2 on 19 October 1976. The reason for the high numbers was not readily apparent. The limpets may have drifted to Stations 1A1 and 1A2 from rocks located upstream.

3.2.1 DENSITY

Densities of benthic macroinvertebrates were dominated by a few taxa (Table 3.2-37). Limnodrilus hoffmeisteri was most abundant and ranged from 390/m^2 (Station 1A2 in April) to 9,776/m^2 (Station 11A1 in October). Peak densities occurred in June at Stations 1A1, 11A2, and 9B1 and in September at 1A2. Lowest densities occurred in April at all stations.

Peak densities of Chironomus decorus occurred at all stations in June. The greatest density (4,863/m^2) was at Station 9B1. No C. decorus were collected at Stations 1A2, 11A1, and 9B1 in April, and at 11A1 in October.

Nais elinguis reached a peak density of 4,612/m^2 at Station 1A1 in May. No N. elinguis were collected after June.

1565 142

POOR ORIGINAL

3.2.2 BIOMASS

At most stations and months the pleuroceriid snail, Goniobasis virginica, comprised the greatest biomass and peaked at 8,734.4 mg/m^2 at Station 11A2 in September (Table 3.2-38). The greatest biomass (2,103.3 mg/m^2) for L. hoffmeisteri occurred at 11A2 in June. C. decorus outweighed all organisms at Station 9B1 in May and June, and peaked (3,022.4 mg/m^2) in June.

3.2.3 DIVERSITY (D)

Monthly D values at each station ranged from 0.66 to 2.76 (Table 3.2-39). The lowest D value (0.66) occurred at Station 9B1 in April; L. hoffmeisteri comprised 91.3% of the organisms in the sample. The highest D value (2.76) occurred at 1A2 in May; L. hoffmeisteri accounted for only 42.8% of the sample. D values were generally higher at Station 1A1.

3.2.4 PERCENT SIMILARITY COMPOSITION

Numbers and percent composition of benthic organisms and calculated PSc indices are presented in Tables 3.2-36 and 3.2-40, respectively. The PSc values were in the intermediate to high affinity range (>50% similarity). Index values indicated that Stations 1A2 and 9B1 were the most similar; Stations 1A1 and 11A1 were the least similar. The PSc values indicated that 1A2, 11A1, 11A2, and 9B1 were more similar in their faunal associations with each other than with Station 1A1.

3.2.6 ANALYSIS OF VARIANCE

Results of the ANOVA (randomized block design) for number of taxa revealed significant differences (P = 0.05) between stations and sample

POOR ORIGINAL

dates (Table 3.2-41). Application of the Student-Newman-Keuls multirange test ($P = 0.05$) between station means ($\bar{y}$) indicated Station 1A1 was significantly different from the other stations and possessed the greatest mean number of taxa (Table 3.2-42). Station 1A2 was similar to 9B1 and Station 11A1 was similar to 11A2 and 9B1. Station 1A2 differed significantly from 11A1 and 11A2 in number of taxa.

The multirange test performed on numbers of taxa between sample dates showed no significant difference between the two sample dates for each month (Table 3.2-43). Comparison of number of taxa by month revealed that the 6 April date was significantly different from the 4 and 18 May dates and the 20 April date differed from 4 May, but was similar to 18 May. The number of taxa taken on 4 May was different from the number taken on 1 June, and similar to 15 June. The 18 May date was similar to both June dates. Numbers of taxa collected on 1 June differed from both July dates and 15 June was similar to both July dates. No significant difference was indicated when comparing July to August, August to September, and September to October. The lowest number of taxa was recorded on both April dates. Numbers of taxa collected in May and June were highest.

Results of the three-factor ANOVA for populations of Limnodrilus hoffmeisteri revealed significant differences ($P = 0.05$) between years, benthic sample dates, stations, and the interaction between these factors. The station factor had the greatest effect on densities of L. hoffmeisteri (Table 3.2-44).

The Student-Newman-Keuls multirange test performed on year means revealed all three years were significantly different. Mean densities of L. hoffmeisteri were highest in 1976 and lowest in 1974 (Table 3.2-45).

Application of the multirange test to sample dates showed no significant differences between densities on the two dates sampled each month (Table 3.2-46). Comparison of densities by month revealed that the first and second May sampling dates differed from the first and second June dates. Both June dates had densities similar to the two July dates. Densities for the first July date were significantly different from the first August date and the second July date differed from both August dates. The density for the first August date differed from both September dates and the second August date was similar to the September dates. Both September densities differed from the two October densities. Densities of L. hoffmeisteri were low during October, May, and August. High densities recorded in June, July, and September were not significantly different.

The multirange test applied to densities at the macroinvertebrate stations revealed all were different, except Stations 11A1 and 11A2 (Table 3.2-47). The two stations were similar and had the highest mean densities of the macroinvertebrate stations. Station 1A1 had the lowest mean density of L. hoffmeisteri.

POOR ORIGINAL

1565 145

3.3 DISCUSSION

The nature of the substrate has been found to be the most important factor that determines species distribution (Brinkhurst and Jamieson 1971; Hynes 1972; Warman 1974). Chutter (1969) and deMarch (1976) have demonstrated that changes in substrate result in changes of macroinvertebrate populations. Hynes (1972), Hoopes (1974), Polk et al. (1976), and Massengill (1976) concluded that high flows scour substrates and wash away many organisms. Massengill (1976) and Tebo (1970) found this particularly true of substrates composed of sand and silt (mud) where finer sediments are washed away, leaving sand. Shifting substrates create an unstable habitat (Chutter 1969; Tebo 1970). Massengill (1976) found that ice affects substrates, particularly those composed of sand.

Substrates at Stations 1A1 and 1A2 were basically similar (Table 3.1-1). Substrates at Stations 11A1 and 11A2 were composed of compacted mud with coal and fine sand over a gravel substratum. The substrate at Station 9B1 consisted of mud. During high flows, silt and allochthanous materials were washed away, leaving behind the heavier materials. The substrate of Station 1A1 was more susceptible to changes in river flow.

Ice exerts a heavy influence on the substrate at Stations 1A1 and 1A2. Effects of ice were not as severe at Stations 11A1 and 11A2, where operation of TMINS leaves the area free of ice. In the spring, ice break-up subjects Stations 11A1 and 11A2 to ice scouring. Conditions at Station 9B1 vary from open water to ice cover; the substrate is subjected to scouring.

1565 146

The dominant organism at all stations was Limnodrilus hoffmeisteri. Brinkhurst and Jamieson (1971) found L. hoffmeisteri to be the most abundant organism in shoreline areas with soft sediments. Carr and Hiltunen (1965) found that abundance of tubificid worms was related to organic enrichment of the substrate. Polk et al. (1976) and results of the three-factor ANOVA indicated that Station 1A1 produced the lowest density and was significantly different from the other stations. The unstable, abrasive, and organically poor sand and coal substrate at 1A1 may account for the low density. Similar densities at Stations 1A2 and 9B1 (Polk et al. 1976) could be attributed to the similarity of habitat; both stations are backwater areas during low flow. Stations 11A1 and 11A2 produced the highest densities and the three-factor ANOVA revealed they were not significantly different. The close proximity and like substrate may account for the similarities at these stations.

The three-factor ANOVA revealed populations of L. hoffmeisteri were highest in early June. Densities were lowest in May and October; periods most affected by ice or high river flow. Kennedy (1966) found that ice cover caused cessation of winter breeding activity in L. hoffmeisteri. Stations significantly affected by flood waters were 1A1, 1A2, and 9B1 (Polk et al. 1976).

Chironomid populations were affected by substrate and reproductive cycles. Polk et al. (1976) found Chironomus populations were affected by the September 1975 flood waters (Hurricane Eloise). Chironomids are holometabolous insects, and population fluctuations are caused in part by pupal

1565 147

POOR ORIGINAL

emergence (adults are not aquatic). Reproductive cycles for some chironomids range from several generations a year to one every two years (Roback 1974a). Interspecific competition is reduced by staggered breeding periods (Reid 1961; Grant and Mackay 1969), and could account for high numbers of Orthocladiinae in the spring, and Chironominae later in the year. Low numbers of C. decorus were observed at Station 11A1, April through October 1976. Reasons for low numbers of C. decorus were not apparent.

Leeches were most abundant at Stations 11A1 and 11A2. Members of the genus Helobdella are known to feed on mollusks (Sawyer 1972; Klemm 1975, 1976). Specimens of Helobdella were often found inside the shells of the snail Goniobasis virginica. This snail possesses an operculum, a hard shell-like disc which closes the shell aperture. Klemm (personal communication) believes the leeches may use the shells as an attachment substrate, as snails preyed upon by Helobdella are non-operculate. Maloney and Chandler (1976) reported that H. lineata feeds on Goniobasis under laboratory conditions. The greatest number of Helobdella collected coincided with the greatest number of Goniobasis collected at 11A1 and 11A2 in 1976.

Erpobdellid leeches were collected only at Stations 11A1 and 11A2. Sawyer (1974) states "no other single factor is more important in restricting the distribution of freshwater leeches than the availability of food organisms". Erpobdellids are predacious on oligochaetes and insect larvae. Oligochaete numbers were highest at 11A1 and 11A2.

1565 148

POOR ORIGINAL

Spatial (station) comparisons made with 1976 data indicated that Station 1A1 differed from all other stations in number of taxa and species composition. This was due to substrate variability and drift from upstream locations. Station 1A2 was similar to 9B1 in number of taxa and species composition (91% similar); this may have resulted from similarities in habitat most of the year. Stations 11A1 and 11A2 were similar in number of taxa and species composition (89% similar); this may be caused by station proximity and substrate similarity.

The benthic communities had high numbers of taxa in May and June (Figure 3.3-1). This was attributed to seasonal abundance of naidid worms and orthocladiinid Chironomidae. Naidids, especially the genus Nais, mature simultaneously in the spring. Populations reach a maximum in June, then die off rapidly due to degeneration of the digestive tract caused by reproductive activity (Loden 1976). The seasonality of naidids at Three Mile Island concurs with Loden's work.

Wihlm (1970) collected data from numerous authors and found, in general, that diversity (D) values less than one were indicative of "stressed" communities. Values greater than three were indicative of communities associated with "good-excellent" water quality. Ischinger and Nalepa (1966) attributed low diversity of benthic fauna to low habitat diversity rather than poor water quality. Trends in D values along Three Mile Island from 1974 to 1976 indicated "poor" to "good" water quality or habitat diversity (Table 3.3-1, Figure 3.3-2). D values were generally higher at Station 1A1, where conditions were "good". Stations 1A2 and 9B1 displayed generally "fair" values, while 11A1 and 11A2 fluctuated from "poor" to "fair".

No apparent effects on benthic communities at Stations 11A1, 11A2, and 9B1 were noted due to the shutdown of TMINS for refueling (21 February to 27 May 1976) or the dredging operations in front of the Intakes for Units 1 and 2 (August through September 1976).

Trace amounts of oil were present in most samples at all stations. No effects of oil on macroinvertebrates have been observed.

In summary, the variability of the substrate influenced by river flow and ice exerts more stress on the benthic communities along Three Mile Island than the operation of TMINS. This completes the macroinvertebrate requirements of the ETS for Unit 1; the program will be continued as specified in the ETS for Unit 2.

Beck, E.C., and W.M. Beck, Jr. 1969. Chironomidae (Diptera) of Florida. III. The Harnischia complex (Chironominae). Bull. Fla. St. Mus. 13(5):277-313.

Beck, W.M., Jr., and E.C. Beck. 1966. Chironomidae (Diptera) of Florida: I. Pentaneurini (Tanypodinae). Bull. Fla. St. Mus. 10(8):305-379.

Boesel, M.W. 1974. Observations on the Coelotanypodini of the northeastern states, with keys to the known stages (Diptera:Chironomidae:Tanypodinae). J. Kans. Ent. Soc. 47(4):417-432.

Brinkhurst, R.O., and B.G.M. Jamieson. 1971. Aquatic Oligochaeta of the world. University of Toronto Press, Toronto. 860 pp.

Brown, H.P. 1972. Biota of freshwater ecosystems identification manual No. 6. Aquatic dryopoid beetles (Coleoptera) of the United States. U.S. Government Printing Office, Washington, D.C. 82 pp.

Burch, J.B. 1973. Biota of freshwater ecosystems identification manual No. 11. Freshwater unionacean clams (Mollusca:Pelecypoda) of North America. U.S. Government Printing Office, Washington, D.C. 176 pp.

1565 150

Burks, B.D. 1975. The mayflies, or Ephemeroptera, of Illinois. [First published in 1953 as Illinois Nat. Hist. Survey, Bull. 26(1).]. Reprinted by Entomological Reprint Specialists, Los Angeles, California. 216 pp.

Carr, J.F., and J.K. Hiltunen. 1965. Changes in the bottom fauna of western Lake Erie from 1930 to 1961. Limnol. and Oceanogr. 10(4):551-569.

Chutter, F.M. 1969. The effects of silt and sand on the invertebrate fauna of streams and rivers. Hydrobiologia 34(1):57-76.

Curry, L.L. 1958. Larvae and pupae of the species of Cryptochironomus (Diptera) in Michigan. Limnol. and Oceanogr. 3(4):427-442.

deMarch, B.G.E. 1976. Spatial and temporal patterns in macrobenthic stream diversity. J. Fish. Res. Board Can. 33:1261-1270.

Edmondson, W.T. (editor). 1959. Freshwater biology. Second edition. John Wiley and Sons, New York, New York. 1248 pp.

Elliot, J.M. 1971. Some methods for the statistical analysis of samples of benthic invertebrates. Freshwater Biological Association Scientific Publication No. 25. Ambleside, Westmorland, U.K. 144 pp.

Foster, N. 1972. Biota of freshwater ecosystems manual No. 4. Freshwater polychaetes (Annelida) of North America. U.S. Government Printing Office, Washington, D.C. 15 pp.

Grant, P.R., and R.J. Mackay. 1969. Ecological segregation of systematically related stream insects. Can. J. Zool. 47:691-694.

Harman, W.N. 1974. Snails (Mollusca:Gastropoda), pp. 275-312. In C.W. Hart Jr. and S.L.H. Fuller (editors). Pollution ecology of freshwater invertebrates. Academic Press, Inc., New York, New York.

Harman, W.N., and C.O. Berg. 1971. The freshwater snails of central New York with illustrated keys to the genera and species. Cornell Univ. Ag. Exp. Sta., Ithaca, New York 1(4):1-68.

Hilsenhoff, W.L. 1975. Aquatic insects of Wisconsin. Technical Bull. No. 89. Dept. of Natural Resources, Madison, Wisconsin. 53 pp.

Hiltunen, J.K. 1965. Distribution and abundance of the polychaete, Manayunkia speciosa Leidy, in western Lake Erie. Ohio. J. Sci. 65(4):183-185.

_____. 1973. Keys to the tubificid and naidid Oligochaeta of the Great Lakes region. Second edition. Great Lakes Fishery Laboratory, Ann Arbor, Michigan. 25 pp.

1565 151

POOR ORIGINAL

Holsinger, J.R. 1972. Biota of freshwater ecosystems identification manual No. 5. The freshwater amphipod crustaceans (Gammaridae) of North America. U.S. Government Printing Office, Washington, D.C. 89 pp.

Hoopes, R.L. 1974. Flooding, as the result of Hurricane Agnes; and its effect on a macrobenthic community in an infertile headwater stream in central Pennsylvania. Limnol. and Oceanogr. 19(5):853-857.

Hynes, H.B.N. 1972. The ecology of running waters. University of Toronto Press, Toronto. 555 pp.

Ischinger, L.S., and T.F. Nalepa. 1966. Water Pollution:Freshwater Macroinvertebrates. J. Water Pollut. Contr. Fed. 48(6):1318-1335.

Johannsen, O.A. 1969. Aquatic Diptera. (First published in 1934, 1935, 1937, and 1937 as Parts I through IV. Memoirs 164, 177, 205, and 210 Cornell Univ. Exp. Station). Reprinted by Entomological Reprint Specialists, Los Angeles, California. 369 pp.

Kennedy, C.R. 1966. The life history of Limnodrilus hoffmeisteri Clap. (Oligochaeta:Tubificidae) and its adaptive significance. Oikos 17:158-168.

Kennedy, J.H. 1975. Macroinvertebrates. pp. 339-386. In W.A. Potter and Associates. An ecological study of the Susquehanna River in the vicinity of the Three Mile Island Nuclear Station. Annual Report for 1974. Ichthyological Associates, Inc. 468 pp.

Klemm, D.J. 1972. Biota of freshwater ecosystems identification manual No. 8. Freshwater leeches (Annelida:Hirudinea) of North America. U.S. Government Printing Office, Washington, D.C. 53 pp.

_____. 1975. Studies on the feeding relationships of leeches (Annelida: Hirudinea) as natural associates of mollusks. Sterkiana (58):1-50; (59):1-20.

_____. 1976. Leeches (Annelida:Hirudinea) found in North America mollusks. Malac. Rev. 9:63-76.

Lloyd,M., J.H. Zar, and J.R. Karr. 1968. On the calculation of information-theoretical measures of diversity. Amer. Midl. Nat. 79(7):257-272.

Loden, M.S. 1976. Life history patterns of naidid oligochaetes in Indiana streams. Paper presented at the 24th meeting of North American Benthological Society, LaCrosse, Wisconsin, March 24-26, 1976.

Maloney, S.D., and C.M. Chandler. 1976. Leeches (Hirudinea) in the upper Stones River drainage of middle Tennessee. Amer. Midl. Nat. 95(1): 42-48.

1565 152

Mason, W.T. 1973. An introduction to the identification of chironomid larvae. Environmental Protection Agency, Cincinnati, Ohio. 90 pp.

Mason, W.T., and P.P. Yevich. 1967. The use of phloxine B and rose bengal stains to facilitate sorting benthic samples. Trans. Amer. Micros. Soc. 86(2):221-223.

Massengill, R.R. 1976. Benthic fauna:1965-1967 versus 1968-1972 pp. 39-53. In D. Merriman and L.M. Thorpe. The Connecticut River Study. The Impact of a Nuclear Power Plant. Am. Fish. Soc. Monogr. 1. 252 pp.

Morse, J.C., and I.D. Wallace. 1975. Athripsodes Billberg and Ceraclea Stephens, distant genera of long-horned caddis-flies (Trichoptera: Leptoceridae). Proc. of the First Int. Symp. on Trichoptera. Junk. The Hague. pp. 33-40.

Needham, J.G., and M.J. Westfall, Jr. 1955. A manual of the dragonflies of North America (Anisoptera), including the Greater Antilles and the provinces of the Mexican border. Univ. of California Press, Berkeley and Los Angeles. 615 pp.

Poe, T.P., and D.C. Stefan. 1974. Several environmental factors influencing the distribution of the fresh-water polychaete, Manayunkia speciosa Leidy. Chesapeake Sci. 15(4):235-237

Polk, J.L., and J.H. Epler. 1976. Macroinvertebrates. pp. 241-298. In W.A. Potter and Associates. An ecological study of the Susquehanna River in the vicinity of the Three Mile Island Nuclear Station. Annual Report for 1975. Ichthyological Associates, Inc. 395 pp.

Polk, J.L., J.H. Kennedy, W.A. Potter, and J.H. Epler. 1976. The effects of flooding on populations of Chironomus Meigen (Diptera:Chironomidae) and Limnodrilus Claparede (Oligochaeta:Tubificidae) in the Susquehanna River in the vicinity of Three Mile Island, Pennsylvania. Proc. Pa. Acad. Sci. 50(1):91-95.

Reid, G.K. 1961. Ecology of inland waters and estuaries. Van Nostrand Reinhold Co., New York, New York. 375 pp.

Reynolds, J.W. 1975. Sparganophilus pearsei n. sp. (Oligochaeta:Sparganophilidae) a nearctic earthworm from western North Carolina. Megadrilogica. 2(2):9-11.

Roback, S.S. 1957. The immature tendipedids of the Philadelphia area. Monogr. Acad. Nat. Sci. Philad. No. 9. 180 pp.

_____. 1971. The adults of the subfamily Tanypodinae (= Pelopiinae) in North America (Diptera:Chironomidae). Monogr. Acad. Nat. Sci. Philad. No. 17. 410 pp.

1565 153

_____. 1974a. Insects (Arthropoda:Insecta), pp. 313-376. In C.W. Hart, Jr. and S.L.H. Fuller (editors). Pollution ecology of freshwater invertebrates. Academic Press, Inc., New York, New York.

_____. 1974b. The immature stages of the genus Coelotanypus (Chironomidae: Tanypodinae:Coelotanypodini) in North America. Proc. Acad. Nat. Sci. Philad. 126(2):9-19.

_____. 1976. The immature chironomids of the eastern United States. I. Introduction and Tany, inae-Coelotanypodini. Proc. Acad. Nat. Sci. Philad. 127(14):147-210.

Ross, H.H. 1972. The caddis flies, or Trichoptera, of Illinois. [First published in 1944 as Illinois Nat. Hist. Survey, Bull. 23(1).]. Reprinted by Entomological Reprint Specialists, Los Angeles, California. 326 pp.

Saether, O.A. 1975. Nearctic and Palaearctic Heterotrissocladius (Diptera: Chironomidae). Bull. Fish. Res. Board Can. 193. 65 pp.

_____. 1976. Keys to larvae and pupae of Orthocladiinae and Telmatogetoninae. 61 pp. (Unpublished).

Sawyer, R.T. 1972. North American freshwater leeches, exclusive of the Piscicolidae, with a key to all species. Illinois Bio. Monogr. 46. 154 pp.

_____. 1974. Leeches (Annelida:Hirudinea) pp. 81-142. In C.W. Hart, Jr. and S.L.H. Fuller (editors). Pollution ecology of freshwater invertebrates. Academic Press, Inc., New York, New York.

Sokal, R.R., and F.J. Rohlf. 1969. Biometry, the principles and practice of statistics in biological research. W.H. Freeman, San Francisco. 776 pp.

Spencer, D.R. 1976. Occurrence of Manayunkia speciosa (Polychaeta:Sabellidae) in Cayuga Lake, New York, with additional notes on its North American distribution. Trans. Amer. Micros. Soc. 95(1):127-128.

Sublette, J.E., and M.F. Sublette. 1974. A review of the genus Chironomus (Diptera:Chironomidae) V. The maturus-complex. Stud. Nat. Sci. 1(8):1-42.

Tebo, L.B., Jr. 1970. Effects of siltation, resulting from improper logging, on the bottom fauna of a small trout stream in the southern Appalachians. The Prog. Fish-Cul. 17(1955):64-70.

Usinger, R.L. (editor). 1956. Aquatic insects of California with keys to North American genera and California species. Univ. of California Press. Berkeley and Los Angeles. 508 pp.

1565 154

Walker, E.M. 1958. The Odonata of Canada and Alaska. Volume Two. Part III: the Anisoptera - four families. Univ. of Toronto Press, Toronto. 318 pp.

Walker, E.M., and P.S. Corbet. 1975. The Odonata of Canada and Alaska. Volume Three. Part III: the Anisoptera - three families. Univ. of Toronto Press, Toronto and Buffalo. 307 pp.

Whittaker, R.H., and [illegible]. Fairbanks. 1958. A study of plankton copepod communities in the Columbia Basin, southeastern Washington. Ecology 39:46-65.

Wilhm, J.L. 1970. Range of diversity index in benthic macroinvertebrate populations. J. Water Pollut. Contr. Fed. 42(5) Part 2:R221-224.

Woolf, C.M. 1968. Principles of biometry. Van Nostrand Co., Lts., Toronto, Canada. 359 pp.

1565 155

POOR ORIGINAL

Table 3.1-1

Location and description of macroinvertebrate stations.

Station Number *	Location and Description
TM-AQI-1A1*	40° 09' 52" N, 76° 43' 26" W. North end of Sand Beach Island, 30 to 75 m offshore. Water depth varied from 0.5 to 2.0 m. Substrate composed of sand, coal particles, and detritus; sometimes with mud and/or clay. Trace amounts of oil sometimes present.
TM-AQI-1A2	40° 09' 36" N, 76° 43' 30" W. Southwest St. Johns Island, 1 to 15 m offshore at mouth of channel between TMI and St. Johns Island. Water depth varied from 0.5 to 1.5 m. Substrate composed mostly of sand, coal particles, [illegible], and detritus; sometimes with gravel or clay. Trace amounts of oil sometimes present.
TM-AQI-11A1	40° 09' 09" N, 76° 43' 39" W. 1 to 10 m downstream from TMI Discharge, 1 to 15 m offshore. Water depth varied from 0.25 to 1.0 m. Substrate composed of mud mixed with coal particles, fine sand, and detritus; sometimes with muck, clay, or gravel. Trace amounts of oil present.
TM-AQI-11A2	40° 09' 07" N, 76° 43' 39" W. 70 to 75 m downstream from TMI Discharge, 1 to 15 m offshore. Water depth varied from 0.25 to 1.5 m. Substrate composed of mud with fine sand, some coal particles, and detritus; sometimes with clay. Trace amounts of oil present.
TM-AQI-9B1	40° 08' 03" N, 76° 43' 33" W. 1900 m downstream from TMI Discharge, 5 to 15 m offshore. Water depth varied from 0.75 to 1.5 m. Substrate composed of mud with muck, detritus, and fine sand, with some coal particles. Trace amounts of oil present.

*Polar coordinate prefix TM-AQI- deleted from all station numbers for discussion in text.

1565 156

Macroinvertebrates taken from the Susquehanna River in the vicinity of Three Mile Island.

- Coelenterata
  - Hydrozoa
    - Hydroida
      - Hydridae
        - Hydra sp.
    - Lymnomedusa
      - Olindiadidae
        - Craspedacusta sowerbyi Lankester
- Platyhelminthes
  - Turbellaria
    - Tricladida
      - Planariidae
        - Dugesia tigrina (Girard)
- Nemertinea
  - Enopla
    - Haplonemertini
      - Tetrastemmatidae
        - Prostoma rubrum (Leidy)
- Nematoda
- Acanthocephala
  - Palaeacanthocephala
    - Echinorhynchidae
      - Leptorhynchoides thecatus (Linton)
- Entoprocta
  - Urnatellida
    - Urnatellidae
      - Urnatella gracilis Leidy
- Bryozoa
  - Phylactolaemata
    - Lophopodidae
      - Lophopodella carteri (Hyatt)
      - Pectinatella magnifica (Leidy)
    - Plumatellidae
      - Hyalinella punctata (Hancock)
      - Plumatella repens (Linnaeus)
  - Gymnolaemata
    - Ctenostomida
      - Paludicellidae
        - Paludicella articulata (Ehrenberg)
- Annelida
  - Polychaeta
    - Errantia
      - Sabellidae
        - Manayunkia speciosa Leidy
  - Oligochaeta
    - Plesiopora
      - Enchytraeidae
      - Naididae
        - Arcteonais lomondi (Martin)
        - Aulophorus furcatus (Muller)
        - Chaetogaster diaphanus (Gruithuisen)
        - Nais bretscheri Michaelsen
        - N. elinguis Muller
        - N. variabilis Piguet
        - Ophidonais serpentina (Muller)
        - Paranais frici Hrabe
        - Slavina appendiculata (d'Udekem)
      - Tubificidae
        - Aulodrilus pluriseta (Piguet)
        - Branchiura sowerbyi Beddard
        - Ilyodrilus templetoni (Southern)
        - Limnodrilus cervix Brinkhurst
        - L. claparedeianus Ratzel
        - L. hoffmeisteri Claparède
        - L. spiralis (Eisen)
        - L. udekemianus Claparède
        - Peloscolex ferox (Eisen)
        - P. multisetosus (Smith)
        - Tubifex tubifex (Muller)
    - Prosopora
      - Lumbriculidae
    - Branchiobdellida
    - Opisthopora
      - Sparganophilidae
        - Sparganophilus eiseni Smith
- Hirudinea
  - Rhynchobdellida
    - Glossiphoniidae
      - Helobdella elongata (Castle)
      - H. lineata (Verrill)
      - Placobdella montifera Moore
      - P. parasitica (Say)
    - Piscicolidae
      - Myzobdella lugubris Leidy
  - Pharyngobdellida
    - Erpobdellidae
      - Erpobdella punctata (Leidy)
      - Mooreobdella microstoma (Moore)
- Arthropoda
  - Arachnida
    - Araneae
      - Pisauridae
        - Dolomedes triton (Walckenaer)
    - Hydracarina
  - Crustacea
    - Copepoda
      - Lernaeidae
        - Lernaea sp.
    - Branchiura
      - Argulus catostomi Dana and Herrick
    - Isopoda
      - Asellidae
        - Asellus communis Say
    - Amphipoda
      - Gammaridae
        - Crangonyx sp.
        - Gammarus fasciatus Say
    - Decapoda
      - Astacidae
        - Orconectes obscurus (Hagen)
        - O. rusticus (Girard)
- Insecta
  - Collembola
  - Ephemeroptera
    - Siphlonuridae
      - Isonychia sp.
      - Siphlonurus sp.
    - Baetidae
      - Baetis sp
    - Heptageniidae
      - Stenacron carolina (Banks)
      - S. interpunctatum (Say)
      - Stenonema ares Burks
      - S. pulchellum (Walsh)
    - Leptophlebiidae
      - Leptophlebia sp.
    - Ephemerellidae
      - Ephemerella aestiva McDunnough
      - E. serrata group sp.
      - E. verisimilis McDunnough
    - Tricorythidae
      - Tricorythodes sp.
    - Caenidae
      - Caenis gizza Burks
    - Potamanthidae
      - Potamanthus sp.
    - Ephemeridae
      - Hexagenia limbata (Serville)
      - H. rigida McDunnough
    - Baetiscidae
      - Baetisca sp.
  - Odonata
    - Aeshnidae
      - Anax junius (Drury)
    - Gomphidae
      - Dromogomphus spinosus Selys
      - Gomphus (Aphomphus) villosipes Selys
      - G. (Gomphurus) vastus Walsh
      - G. (Gomphus) lividus Selys
      - G. (Stylurus) spiniceps (Walsh)
    - Macromiidae
      - Macromia illinoiensis Walsh
    - Cordulidae
      - Epitheca princeps Hagen

1565 157

POOR ORIGINAL

POOR ORIGINAL

Table 3.1-2 continued.

Arthropoda - continued
- Insecta - continued
  - Odonata - continued
    - Libellulidae
      - Libellula luctuosa Burmeister
      - L. lydia Drury
      - L. pulchella Drury
      - Pachydiplax longipennis (Burmeister)
      - Pantala flavescens (Fabricius)
      - P. hymenea (Say)
      - Perithemis tenera (Say)
    - Calopterygidae
      - Hetaerina americana (Fabricius)
    - Coenagrionidae
      - Argia apicalis (Say)
      - A. moesta (Hagen)
      - A. translata (Hagen)
      - Enallagma civile (Hagen)
      - E. exsulans (Hagen)
      - Ischnura verticalis (Say)
  - Plecoptera
    - Pteronarcidae
      - Pteronarcys sp.
    - Taeniopterygidae
      - Brachyptera fasciata (Burmeister)
      - Taeniopteryx sp.
    - Nemouridae
      - Nemoura delosa Ricker
    - Capniidae
      - Allocapnia sp.
    - Perlidae
      - Acroneuria sp.
      - Perlesta placida (Hagen
    - Perlodidae
      - Isoperla bilineata (Say
  - Hemiptera
    - Corixidae
      - Sigara alternata (Say)
      - Trichocorixa calva (Say)
    - Notonectidae
      - Notonecta undulata Say
    - Belostomatidae
      - Belostoma sp.
    - Nepidae
      - Ranatra nigra Herrich-Schaeffer
    - Gelastocoridae
      - Gelastocoris oculatus (Fabricius)
    - Gerridae
      - Gerris argenticollis Parshley
      - G. conformis (Uhler)
      - Metrobates hesperius Uhler
      - Rheumatobates rileyi Bergroth
    - Veliidae
      - Microvelia americana (Uhler)
      - Rhagovelia obesa Uhler
    - Mesoveliidae
      - Mesovelia mulsanti White
    - Saldidae
      - Pentacora licata (Say)
      - Saldula sp.
  - Megaloptera
    - Sialidae
      - Sialis sp.
    - Corydalidae
      - Corydalus cornutus (Linnaeus)
  - Neuroptera
    - Sisyridae
      - Climacia areolaris (Hagen)
  - Trichoptera
    - Psychomyiidae
      - Psychomyia flavida Hagen
    - Polycentropodidae
      - Neureclipsis sp.
      - Polycentropus cinereus Hagen
    - Hydropsychidae
      - Cheumatopsyche campyla Ross
      - Hydropsyche aerata Ross
      - H. bifida group sp.
      - H. morosa Hagen
      - H. phalerata Hagen
      - Macronema carolina Banks
      - M. zebratum Hagen
    - Glossosomatidae
      - Protoptila palina (Ross)
    - Hydroptilidae
      - Hydroptila spatulata Morton
      - H. waltsiana Betten
    - Limnephilidae
      - genus nr. Ironoquia Betten
      - Pycnopsyche guttifera (Say)
    - Leptoceridae
      - Ceraclea cancellata (Betten)
      - C. flava (Banks)
      - C. tarsipunctata (Vorhies)
      - Leptocella exilis (Walker)
      - Mystacides sepulchralis (Walker)
      - Oecetis sp.
  - Lepidoptera
    - Pyralidae
      - Parapoynx sp.
      - Paraponyx allionealis sp.
  - Coleoptera
    - Haliplidae
      - Haliplus sp.
      - Peltodytes duodecimpunctatus (Say)
    - Dytiscidae
      - Copelatus sp.
      - Laccophilus sp.
    - Gyrinidae
      - Dineutus discolor Aubé
      - D. hornii Roberts
      - Gyrinus sp.
    - Hydrophilidae
      - Berosus aculeatus LeConte
      - Tropisternus lateralis nimbatus (Say)
      - T. natator Sharp
    - Psephenidae
      - Psephenus herricki (DeKay)
    - Elmidae
      - Ancyronyx variegata (Germar)
      - Dubiraphia bivittata (LeConte)
      - D. vittata (Melsheimer)
      - Macronychus glabratus Say
      - Optioservus trivittatus (Brown)
      - Oulimnius latiusculus (LeConte)
      - Promoresia elegans (LeConte)
      - Stenelmis decorata (Randall)
      - S. fabrila Notschulsky
    - Chrysomelidae
      - Donacia sp.
  - Diptera
    - Tipulidae
      - Antocha sp.
      - Hexatoma sp.
      - Tipula sp.
    - Psychodidae
      - Pericoma sp.
      - Psychoda sp.
      - Telmatoscopus sp.
    - Culicidae
      - Aedes vexans (Meigen)
    - Chaoboridae
      - Chaoborus punctipennis (Say)
    - Chironomidae
      - Tanypodinae
        - Tanytus sp.
        - Procladius sp.
        - Psectrotanytus sp.
        - Coelotanytus concinnus (Coquillett)
        - C. scalaris (Loew)
        - Ablabesmyia peleensis (Walley)
        - A. nr. philosiphensis Beck and Beck
        - Thienemannimyia group sp.
      - Diamesinae
        - Diamesa sp.
      - Orthocladiinae
        - Brillia sp.
        - Cricotopus bicinctus group sp.
        - C. sylvestris group sp.
        - Cricotopus spp.
        - Eukiefferiella spp.
        - Heterotrissocladius changi Saether
        - Orthocladius (Euorthocladius) sp.
        - Orthocladius (Orthocladius) sp.
        - Parametriocnemus sp.
        - Psectrocladius spp.
        - Smittia sp.
        - genus nr. Tvetenia Kieffer

1565 158

Table 3.1-2 continued.

- Arthropoda - continued
  - Insecta - continued
    - Diptera - continued
      - Chironomidae - continued
        - Chironominae
          - Chironomus decorus Johannsen
          - Cryptochironomus nr. blarina Townes
          - C. nr. fulvus (Johannsen)
          - Demicryptochironomus vulneratus Zetterstedt
          - Dicrotendipes modestus (Say)
          - D. nervosus (Staeger)
          - Endochironomus nr. tendens (Fabricius)
          - Glyptotendipes sp.
          - Harnischia nr. anachoerus Townes
          - Parachironomus sp.
          - Paracladopelma sp.
          - Paratendipes sp.
          - Phaenopsectra (Sergentia) nr. obediens (Johannsen)
          - Phaenopsectra (Tribelos) sp.
          - Polypedilum fallax group sp.
          - P. halterale (Coquillet)
          - P. nr. illinoense (Malloch)
          - P. scalaenum (Schrank)
          - Stenochironomus sp.
          - Stictochironomus sp.
          - Rheotanytarsus nr. exiguus (Johannsen)
          - Tanytarsus nr. buchlevi Sublette
          - Tanytarsus spp.
        - Ceratopogonidae
          - Palpomyia group sp.
        - Simuliidae
          - Simulium (Psilozia) vittatum Zetterstedt
        - Tabanidae
          - Chrysops sp.
        - Empididae
          - Hemerodromia sp.
        - Dolichopodidae
        - Ephydridae
        - Muscidae
          - Fannia sp.
          - Limnophora sp.

- Mollusca
  - Gastropoda
    - Basommatophora
      - Physidae
        - Physa sp.
      - Lymnaeidae
        - Lymnaea humilis Say
      - Planorbidae
        - Gyraulus parvus (Say)
        - Helisoma trivolvis (Say)
      - Ancylidae
        - Ferrissia rivularis (Say)
        - F. fragilis (Say)
    - Mesogastropoda
      - Pleuroceridae
        - Goniobasis virginica (Gmelin)
        - Spiroidon carinata (Brugière)
      - Valvatidae
        - Valvata tricarinata (Say)
      - Hydrobiidae
        - Amnicola limosa (Say)
        - Bithynia tentaculata (Linnaeus)
      - Viviparidae
        - Campeloma decisa (Say)
  - Pelecypoda
    - Eulamellibranchia
      - Unionidae
        - Anodonta cataracta (Say)
        - Elliptio complanata (Lightfoot)
        - Lampsilis sp.
    - Heterodonta
      - Sphaeriidae
        - Pisidium sp.
        - Sphaerium sp.

POOR ORIGINAL

1565 159

POOR ORIGINAL

Table 3.2-1

Numbers and milligrams of biomass, = (mg), of benthic organisms per Ponar grab (529 cm^2) at Station TM-AQ1-1A1, April 1976. Dashes indicate species not present or no weight measurement made.

Date	6 April				20 April			
Time	0935				0940			
Air Temp. (C)	13.5				25.5			
Water Temp. (C)	8.0				20.0			
Dissolved Oxygen (ppm)	9.8				8.4			
pH	7.6				8.0			
Secchi Disc (cm)	43.2				127.0			
River Stage (ft)	6.6				4.7			
Substrate	Sand, Coal, Mud, Detritus				Sand, Coal, Detritus, Mud			
Replicate	A	B	C	D	A	B	C	D
Nemertinea	-	1(-)	1(-)	2(-)	-	1(-)	-	-
Nematoda	-	-	1(-)	1(-)	1(-)	2(-)	1(-)	1(-)
Enchytraeidae	1(-)	-	1(-)	1(-)	-	-	-	-
Nais bretscheri	1(-)	1(-)	-	3(-)	-	-	-	-
N. elinguis	-	-	-	-	3(-)	1(-)	4(-)	-
N. variabilis	-	-	1(-)	1(-)	-	-	-	1(-)
Branchiura sowerbyi	-	-	-	-	1(0.6)	1(1.0)	-	1(3.5)
Limnodrilus claparedeianus	2(-)	-	3(-)	1(-)	10(5.9)	10(5.1)	-	-
L. hoffmeisteri	-	1(-)	2(-)	4(-)	-	-	12(7.0)	32(14.6)
L. udekemianus	-	-	1(-)	-	-	-	-	-
Limnodrilus spp.	4(-)	10(-)	6(-)	17(-)	19(11.2)	29(14.9)	38(22.1)	29(17.8)
Peloscolex multisetosus	1(-)	1(-)	-	1(-)	1(-)	-	-	-
Tubifex tubifex	-	-	-	-	-	1(-)	-	1(-)
imm. tub./cap. chaetae*	-	1(-)	1(-)	2(-)	-	-	3(-)	8(3.6)
Lumbriculidae	-	-	-	1(-)	-	-	1(-)	-
Megadrile	-	-	-	-	-	-	1(-)	1(-)
Oecetis sp.	1(-)	-	-	-	-	-	-	-
Psychoda sp. pupa	-	-	-	1(0.7)	-	-	-	-
Procladius sp.	-	-	1(-)	-	-	-	-	-
Cricotopus spp.	-	-	1(-)	-	-	-	-	-
Cricotopus spp. pupa	-	-	2(-)	-	-	-	-	-
Parametriocnemus sp.	-	-	1(-)	-	-	-	-	-
Chironomus decorus	-	-	-	-	1(-)	-	1(-)	-
Phaenopsectra nr. obediens	-	-	-	-	1(-)	-	-	4(-)
Polypedilum fallax group sp.	-	-	-	-	-	-	-	1(-)
Ferrissia spp.	1(-)	-	-	-	-	-	-	-
Corbicula virginica	4(17.2)	-	6(82.3)	1(9.1)	7(103.2)	-	3(8.6)	-
Pisidium sp.	-	17(-)	16(-)	12(-)	5(-)	17(-)	4(-)	-
Sphaerium sp.	-	4(5.0)	12(-)	3(-)	-	2(-)	1(-)	3(-)

* Immature tubificid with capilliform chaetae.

1565 160

POOR ORIGINAL

Table 3.2-2

Numbers and milligrams of biomass, # (mg), of benthic organisms per Ponar grab (529 cm^2) at Station TM-AQI-1A1, May 1976. Dashes indicate species not present or no weight measurement made.

Date	4 May				18 May			
Time	1009				1015			
Air Temp. (C)	NA				19.0			
Water Temp. (C)	11.8				20.0			
Dissolved Oxygen (ppm)	9.0				8.0			
pH	7.8				NA			
Secchi Disc (cm)	66.0				61.0			
River Stage (ft)	4.9				4.6			
Substrate	Mud, Sand, Coal, Some Detritus				Mud, Sand, Coal, Some Detritus			
Replicate	A	B	C	D	A	B	C	D
Nemertinea	-	-	-	-	-	-	1(0.5)	1(-)
Nematoda	12(1.4)	7(0.5)	7(0.3)	7(0.7)	4(-)	4(-)	2(-)	-
Plumatella repens	P*	-	-	P	-	-	-	-
Chaetogaster diaphanus	-	-	-	-	2(-)	-	-	5(-)
Nais bretscheri	12(0.3)	-	-	-	-	-	-	-
N. elinguis	115(2.7)	153(2.7)	231(5.4)	138(3.2)	685(16.6)	58(1.2)	205(5.2)	324(8.4)
N. variabilis	-	24(0.4)	24(0.6)	10(0.2)	59(1.4)	-	11(0.3)	-
Ophidonais serpentina	-	-	-	-	30(0.7)	-	-	-
Paranais frici	-	35(0.6)	-	-	3(-)	-	-	15(0.4)
Branchiura sowerbyi	1(-)	-	1(0.6)	-	-	-	-	-
Limnodrilus templetoni	-	-	-	-	-	-	8(2.3)	-
Limnodrilus claparedeianus	-	-	-	-	20(2.6)	-	-	-
L. hoffmeisteri	32(7.7)	54(8.1)	5(0.7)	10(1.5)	41(5.3)	11(2.2)	21(4.2)	65(13.9)
L. udekemianus	-	14(2.1)	-	-	-	-	-	-
Limnodrilus spp.	128(30.9)	82(12.3)	128(18.0)	121(18.6)	183(23.7)	69(13.9)	127(25.1)	43(9.2)
Potamothrix multisetosus	2(4.0)	-	-	2(0.7)	-	-	4(0.9)	3(1.9)
Tubifex tubifex	5(0.9)	13(2.6)	8(2.4)	-	44(9.2)	-	8(2.3)	17(3.2)
Unm. tub./cap. chaetae**	18(3.3)	21(4.2)	32(9.8)	-	52(10.8)	13(-)	31(8.9)	17(3.7)
Aeolosoma	2(-)	1(-)	-	-	-	-	-	-
Helobdella lineata	-	1(1.9)	-	-	-	-	-	-
Helobdella sp.	-	-	-	-	-	-	1(-)	-
Hydracarina	1(-)	1(-)	-	-	-	-	-	-
Dugesia communis	-	-	-	-	-	-	1(0.2)	-
Lernaea fasciatus	-	1(-)	1(-)	-	4(0.5)	3(0.4)	4(1.1)	4(1.2)
Hydropsyche sp.	1(-)	3(1.0)	1(0.8)	4(2.2)	-	-	-	-
Hydropsyche phalerata	-	-	-	1(1.1)	-	-	-	-
Cricotopus sp.	-	-	-	-	1(-)	-	-	-
Dicrotendipes spp.	1(-)	-	-	-	-	-	-	-
Eukiefferiella sp.	-	-	-	-	3(2.7)	2(-)	2(-)	2(-)
Limnophyes sp.	-	2(-)	-	-	-	-	-	-
Micropsectra spp.	-	5(0.1)	1(-)	3(0.3)	-	1(-)	-	-
Micropsectra spp. pupa	-	1(-)	2(-)	-	-	-	-	-
Parakiefferiella sp. A	1(-)	-	-	-	-	-	-	-
Orthocladius (Euorthocladius) sp.	-	-	-	3(0.3)	-	-	-	-
Orthocladius (Orthocladius) sp.	1(-)	9(0.2)	18(0.5)	9(0.8)	-	2(-)	3(-)	-
Orthocladius (Orthocladius) sp. pupa	-	-	-	2(-)	-	1(-)	-	-
Paratrichocladius sp.	-	4(0.1)	1(-)	-	-	-	-	1(-)
Chironomus decorus	-	-	2(-)	-	3(-)	5(-)	2(-)	2(-)
C. decorus pupa	1(-)	-	-	-	-	-	-	-
Phaenopsectra nr. obediens	-	1(-)	-	-	-	-	-	-
Polypedilum fallax pupa	-	-	-	-	4(0.8)	1(-)	3(-)	2(-)
P. nr. illinoense	-	1(-)	-	-	-	-	-	-
Tanytarsini pupa	3(-)	-	12(0.3)	-	-	-	-	-
Tanytarsus sp.	-	1(-)	-	-	-	-	-	-
Tribelos group sp.	-	1(-)	-	-	-	1(-)	-	-
Tribelos sp.	-	-	-	-	-	-	1(-)	
Nais sp.	-	-	1(-)	-	-	-	-	-
Peloscolex variegatus	2(9.9)	-	-	-	1(20.3)	-	-	1(30.7)
Tubificidae sp.	1(-)	-	2(-)	-	7(5.0)	-	2(1.0)	2(2.0)
Unidentified sp.	-	2(-)	1(-)	-	-	-	1(-)	3(5.2)

NA = Not Available.

* Quantization not possible; denotes organism present.

** Immature tubificid with capilliform chaetae.

1565 161

POOR ORIGINAL

Table 3.2-3

Numbers and milligrams of biomass, dry (mg), of benthic organisms per Ponar grab (529 cm^2) at Station TM-AQ1-1A1, June 1976. Dashes indicate species not present or no weight measurement made.

Date	1 June				15 June			
Time	0627				0751			
Air Temp. (C)	22.0				22.8			
Water Temp. (C)	17.0				22.5			
Dissolved Oxygen (ppm)	9.2				7.9			
pH	8.0				7.8			
Secchi Disc (cm)	76.2				76.2			
River Stage (ft)	5.1				4.1			
Sub-trate	Mud, Sand, Coal, Detritus				Mud, Sand, Coal, Detritus			
Rep. rate	A	B	C	D	A	B	C	D
Nematoda	4(-)	13(1.9)	22(1.0)	19(1.6)	-	3(-)	-	-
Plumatella repens	***	-	-	-	-	-	-	-
Arctonais lomondi	1(-)	-	-	10(0.1)	-	-	-	-
Nais bretscheri	-	-	1(-)	13(0.1)	-	-	1(-)	-
N. elinguis	2(-)	-	2(-)	14(0.2)	-	-	-	-
N. variabilis	1(-)	-	-	-	-	-	-	-
Paranais frici	1(-)	-	1(-)	13(0.1)	-	-	-	-
Branchiura sowerbyi	-	-	1(2.3)	-	2(-)	-	-	-
Ilyodrilus templetoni	-	-	-	-	1(-)	1(-)	1(-)	-
Limnodrilus claparedeianus	-	149(28.4)	-	-	36(13.7)	12(3.9)	10(3.1)	-
L. hoffmeisteri	59(16.3)	256(48.8)	124(25.5)	116(16.8)	20(9.2)	59(19.1)	39(11.6)	36(6.6)
L. udekemianus	10(3.1)	-	-	-	-	-	-	-
Limnodrilus spp.	69(21.4)	106(20.2)	162(33.3)	125(18.2)	39(17.8)	47(15.2)	40(11.8)	60(11.0)
Polycelis multisetosus	-	2(0.4)	1(-)	-	-	-	-	-
Tubifex tubifex	3(0.3)	6(0.9)	2(-)	13(2.3)	1(-)	3(-)	1(-)	1(-)
imm. tub./cap. chaetae**	11(1.2)	6(0.9)	6(-)	7(1.2)	8(-)	6(-)	-	3(-)
Hydracarina	1(-)	-	-	-	-	-	-	-
Gammarus fasciatus	1(0.4)	1(0.2)	-	-	1(1.1)	5(0.5)	13(1.3)	2(0.3)
Ephemerella serrata group sp.	-	-	-	1(-)	-	-	-	-
Diamatopsyche sp.	-	1(0.3)	1(0.1)	-	-	-	-	-
Procladius sp.	2(-)	4(0.2)	1(-)	1(-)	-	-	-	-
Psectrotanypus sp.	-	-	-	1(-)	-	-	-	-
Cricotopus sylvestris group sp.	-	-	-	2(-)	-	-	-	-
Cricotopus spp.	-	4(0.2)	8(0.5)	1(-)	-	-	-	-
Cricotopus spp. pupa	-	-	1(-)	-	-	-	-	-
Tokiefferiella sp. A	-	-	-	1(-)	-	-	-	-
Orthocladius (Orthocladius) sp.	1(-)	-	5(-)	1(-)	-	-	-	-
Psectrocladius sp.	-	-	-	-	1(-)	-	-	-
Chironomus decorus	2(-)	-	3(1.0)	9(0.2)	148(33.1)	71(16.5)	19(19.1	109(20.7)
C. decorus pupae	-	-	-	-	-	1(-)	1(-)	-
Cryptochironomus nr. blarina	-	-	-	-	-	-	2(0.2)	-
C. nr. fulvus	-	-	2(0.7)	-	17(3.1)	15(2.6)	17(1.8)	17(4.1)
Dicrotendipes sp.	-	2(0.1)	-	-	-	-	-	-
Glyptotendipes sp.	-	1(0.1)	-	-	-	-	-	-
Paraclaudelpelma sp.	-	-	-	-	1(-)	-	-	-
Rheosmittia nr. obedica	1(-)	2(0.1)	3(0.1)	6(1.2)	10(-)	3(-)	21(3.2)	2(0.2)
Polypedilum nr. scalaenum	-	-	-	-	1(-)	5(-)	-	2(0.2)
Stictochironomus sp.	-	-	-	-	-	-	5(0.6)	-
Tanytarsini	-	-	-	1(-)	-	-	-	-
Rheotanytarsus sp.	-	-	-	-	-	1(-)	-	-
Tanytarsus sp.	-	-	-	-	3(-)	2(-)	7(-)	-
Palpomyia group sp.	-	-	-	-	-	1(-)	-	-
Empididae	-	1(-)	-	-	-	-	-	-
Hemerodromia sp. pupa	-	-	-	1(-)	-	-	-	-
Gonlobasis virginica	1(59.0)	1(6.6)	1(55.0)	2(12.2)	1(38.7)	1(79.7)	4(171.8)	2(43.0)
Pisidium sp.	2(-)	-	1(-)	2(-)	4(3.4)	6(-)	4(-)	-
Sphaerium sp.	1(-)	1(-)	2(1.0)	1(-)	-	5(-)	8(-)	-

* Quantization not possible; denotes organism present.
** Immature tubificid with capilliform chaetae.

1565 162

ble 3.2-4

Numbers and milligrams of biomass, # (mg), of benthic organisms per Ponar grab (529 cm^2) at Station TM-AQI-1A1, July 1976. Dashes indicate species not present or no weight measurement made.

Date	6 July				29 July			
Time	0810				0805			
Air Temp. (C)	23.5				23.0			
Water Temp. (C)	24.0				24.0			
Dissolved Oxygen (ppm)	NA				7.4			
pH	8.3				8.0			
Secchi Dis. (cm)	58.4				45.7			
River Stage (ft)	4.7				4.3			
Substrate	Mud, Sand, Coal, Detritus				Mud, Sand, Coal, Detritus			
Replicate	A	B	C	D	A	B	C	D
Turbellaria	-	1(-)	-	1(3.6)	-	-	-	-
Nematoda	3(-)	2(-)	-	-	-	1(-)	1(-)	-
Aulophorus furcatus	-	1(-)	-	-	-	-	-	-
Branchiura sowerbyi	-	-	-	-	1(-)	2(2.6)	4(26.4)	3(1.5)
Limnodrilus claparedeianus	21(8.5)	9(3.6)	9(3.0)	49(2?.8)	-	11(2.2)	19(5.5)	-
L. hoffmeisteri	31(12.6)	10(4.0)	44(14.6)	29(13.5)	50(18.6)	66(13.4)	47(13.6)	40(22.9)
L. udekemianus	-	-	-	-	-	-	-	10(5.7)
Limnodrilus spp.	135(54.9)	66(26.7)	70(23.3)	118(54.8)	91(33.8)	67(13.6)	76(22.0)	41(23.4)
Peloscolex multisetosus	-	-	-	2(-)	-	-	-	-
Tubifex tubifex	-	1(-)	1(-)	-	1(-)	-	-	-
imm. tub./cap. chaetae*	-	1(-)	3(-)	1(-)	2(-)	-	3(-)	-
Sparganophilus eiseni	-	-	-	-	-	-	1(-)	-
Hydracarina	-	-	-	-	-	1(-)	-	-
Gammarus fasciatus	-	4(0.6)	1(0.1)	1(3.5)	1(0.2)	1(-)	2(0.2)	1(-)
Hydropsyche bifida group sp.	-	1(0.3)	-	-	-	-	-	-
H. phalerata	-	1(0.4)	-	3(4.3)	-	-	-	-
Proporesia sp.	-	-	-	1(0.5)	-	-	-	-
Stenelmis decorata	-	2(1.2)	-	-	-	-	-	-
Procladius sp.	4(2.3)	3(-)	-	3(2.8)	-	1(-)	1(-)	-
Ablabesmyia sp.	-	-	-	2(1.9)	-	-	-	-
Cricotopus spp.	-	-	-	-	-	1(-)	-	-
Chironomus decorus	4(2.3)	9(0.4)	2(-)	2(1.9)	3(1.6)	5(-)	7(1.2)	1(-)
Cryptochironomus nr. fulvus	4(2.3)	2(-)	-	5(3.8)	12(5.3)	6(1.8)	5(-)	5(-)
Harnischia nr. amachaerus	-	-	-	-	-	1(-)	-	-
Paracladopelma sp.	1(0.6)	4(0.1)	1(-)	4(6.4)	-	1(-)	1(-)	-
Phaenopsectra nr. obediens	-	14(0.5)	-	-	-	-	-	-
Polypedilum nr. illinoense	-	-	-	2(1.9)	-	-	-	-
P. scalaenum	2(1.1)	-	4(-)	8(0.7)	-	2(-)	1(-)	-
Goniobasis virginica	2(29.4)	3(117.9)	1(16.5)	4(99.2)	2(70.7)	1(63.0)	-	3(87.6)
Pisidium sp.	1(-)	7(-)	2(-)	1(-)	2(-)	2(-)	5(-)	3(-)
Sphaerium sp.	3(6.9)	2(8.5)	-	-	1(1.6)	2(1.1)	1(0.7)	-

NA = Not Available.
* Immature tubificid with capilliform chaetae.

POOR ORIGINAL

1565 163

POOR ORIGINAL

Table 3.2-5

Numbers and milligrams of biomass, # (mg), of benthic organisms per Ponar grab (529 cm^2) at Station TV-AQI-LA1, August 1976. Dashes indicate species not present or no weight measurement made.

Date	3 August				17 August			
Time	0835				0820			
Air Temp. (C)	21.?				19.0			
Water Temp. (C)	22.?				19.0			
Dissolved Oxygen (ppm)	7.7				8.3			
pH	8.4				8.0			
Secchi Disc (cm)	50.3				15.2			
River Stage (ft)	4.2				4.5			
Substrate	Coal, Sand, Mud, Detritus				Coal, Sand, Mud, Detritus			
Replicate	A	B	C	D	A	B	C	D
Nematoda	-	1(-)	1(-)	1(-)	-	-	1(-)	-
Branchiura sowerbyi	1(-)	-	-	2(9.2)	-	1(0.2)	-	1(1.2)
Ilyodrilus templetoni	-	-	-	-	-	-	1(-)	-
Limnodrilus claparedeianus	11(2.9)	11(2.3)	-	20(4.6)	-	10(3.0)	21(5.7)	31(8.2)
L. hoffmeisteri	45(11.8)	11(2.3)	13(2.5)	61(13.9)	33(10.5)	141(42.2)	62(16.8)	92(24.4)
L. udekemianus	-	21(4.3)	-	10(2.3)	22(7.0)	-	-	-
Limnodrilus spp.	101(26.5)	87(17.9)	79(19.6)	122(27.8)	32(10.2)	60(18.0)	41(11.1)	134(35.6)
Peloscolex multisetosus	-	-	-	-	-	1(0.3)	-	-
imm. tub./cap. chaetae*	-	1(-)	-	-	-	-	1(-)	3(-)
Sparganophilus eigeni	1(-)	-	-	-	-	-	-	-
Crangonyx sp.	1(-)	-	-	-	-	-	-	-
Cambarus fasciatus	1(-)	3(0.4)	-	2(0.4)	2(5.0)	-	-	1(0.4)
Hexagenia sp.	-	-	-	-	-	-	-	1(-)
Caenis sp.	-	-	-	-	-	-	-	1(-)
Procladius sp.	-	4(0.2)	1(-)	2(-)	9(1.6)	2(-)	2(-)	5(1.0)
Chironomus decorus	1(-)	-	-	1(-)	-	1(-)	-	3(-)
Cryptochironomus nr. blarina	-	-	-	9(0.8)	-	-	-	-
C. nr. fulvus	19(7.3)	32(4.0)	17(1.3)	19(1.7)	3(-)	1(-)	5(-)	10(2.1)
Cryptochironomus spp. pupa	-	-	-	2(-)	-	-	-	-
Paracladopelma sp.	2(-)	-	-	19(1.2)	-	-	1(-)	1(-)
Phaenopsectra nr. obediens	-	-	1(-)	-	-	-	-	-
Polypedilum scalaenum	35(1.0)	48(1.9)	49(2.7)	28(1.4)	-	-	-	10(0.8)
P. scalaenum pupa	-	1(-)	-	1(-)	-	-	-	-
Physa sp.	-	-	-	3(-)	-	-	-	-
Goniobasis virginica	2(76.3)	1(31.4)	2(84.6)	2(123.7)	1(69.0)	2(126.2)	6(268.5)	8(481.2)
Unionidae immature	1(-)	-	-	-	-	-	-	-
Pisidium sp.	4(-)	7(-)	2(-)	9(3.0)	3(-)	3(-)	1(-)	2(-)
Sphaerium sp.	3(-)	8(15.7)	-	6(5.2)	-	-	-	-

* Immature tubificid with capilliform chaetae.

1565 164

POOR ORIGINAL

Table 3.2-e

Numbers and milligrams of biomass, # (mg), of benthic organisms per Ponar grab (529 cm^2) at Station TI-A01-1A1, September 1976. Dashes indicate species not present or no weight measurement made.

Date	7 September				21 September			
Time	0817				0830			
Air Temp. (C)	14.5				18.0			
Water Temp. (C)	19.0				20.0			
Dissolved Oxygen (ppm)	7.8				7.3			
pH	7.9				8.0			
Secchi Disc (cm)	50.8				50.8			
River Stage (ft)	3.5				4.1			
Substrate	Sand, Coal, Detritus				Sand, Coal, Mud, Detritus			
Replicate	A	B	C	D	A	B	C	D
Turbellaria	-	-	1(0.1)	-	1(-)	-	-	-
Nemertinea	-	1(-)	3(0.1)	3(0.6)	3(1.2)	3(-)	2(0.7)	4(-)
Nematoda	1(-)	2(-)	-	-	-	-	-	-
Arcteonais lomondi	-	-	-	-	-	-	1(-)	-
Branchiura sowerbyi	-	2(0.2)	2(1.7)	1(1.6)	1(0.7)	-	4(9.7)	1(-)
Ilyodrilus templetoni	-	-	-	-	2(-)	-	-	1(-)
Limnodrilus claparedeianus	-	-	11(2.7)	-	21(3.7)	-	10(2.6)	-
L. hoffmeisteri	30(9.5)	21(6.1)	-	42(15.7)	21(3.7)	40(7.6)	20(5.1)	9(2.1)
Limnodrilus spp.	39(12.4)	85(24.6)	44(10.7)	-	154(27.0)	49(9.3)	51(13.1)	57(13.2)
Peloscolex multisetosus	1(-)	-	-	-	-	-	1(-)	-
Tubifex tubifex	-	-	-	1(-)	-	-	-	-
imm. tub./cap. chaetae*	-	1(-)	4(-)	-	1(-)	1(-)	10(2.6)	-
Gammarus fasciatus	-	-	4(0.8)	-	1(0.5)	5(3.5)	10(1.8)	1(-)
Hexagenia limbata	-	-	1(0.9)	-	-	-	-	-
Hexagenia spp.	-	-	-	-	1(-)	-	-	-
Gomphus spiniceps	-	-	-	-	-	1(-)	-	-
Macromia illinoiensis	-	-	1(2.8)	-	-	-	-	-
Oecetis sp.	-	-	1(-)	-	-	-	-	-
Dubiraphia sp.	-	-	-	-	1(-)	-	-	-
Procladius sp.	-	-	-	-	1(-)	-	-	2(-)
Ablabesmyia sp.	-	-	1(-)	-	1(-)	-	1(-)	-
Cricotopus spp.	-	-	-	-	-	-	1(-)	1(-)
Chironomus decorus	-	-	1(-)	-	142(38.9)	66(19.5)	45(16.6)	26(7.7)
C. decorus pupa	-	-	-	-	2(-)	1(-)	3(-)	-
Cryptochironomus nr. fulvus	2(-)	-	1(-)	1(-)	-	1(-)	1(-)	-
Cryptochironomus spp. pupa	-	-	-	-	-	1(-)	-	-
Demicryptochironomus vulneratus	-	-	-	-	-	-	-	1(-)
Paracladopelma sp.	-	-	-	-	-	2(-)	1(-)	3(-)
Polypedilum nr. illinoense	-	-	-	-	-	-	1(-)	-
P. scalaenum	8(1.0)	-	1(-)	4(-)	-	-	-	-
Ferrissia spp.	-	-	-	-	2(-)	3(-)	-	-
Goniobasis virginica	3(134.2)	1(30.9)	5(287.7)	-	5(214.2)	9(459.4)	3(164.3)	2(83.3)
Pisidium sp.	29(-)	15(-)	27(-)	7(-)	16(-)	16(-)	21(-)	10(-)
Sphaerium sp.	8(7.6)	2(2.6)	-	-	-	-	5(-)	7(-)

* Immature tubificid with capilliform chaetae.

1565 165

POOR ORIGINAL

Table 3.2-7

Numbers and milligrams of biomass, = (mg), of benthic organisms per Ponar grab (529 cm²) at Station TN-A[illegible], October 1976. Dashes indicate species not present or no weight measurement made.

Date	5 October				19 October			
Time	0832				0830			
Air Temp. (C)	14.0				2.5			
Water Temp. (C)	15.0				9.0			
Dissolved Oxygen (ppm)	9.2				11.6			
pH	8.0				7.5			
Secchi Disc (cm)	30.5				27.9			
River Stage (ft)	4.8				5.3			
Substrate	Mud, Coal, Sand, Detritus				Sand, Coal, Mud			
Replicate	A	B	C	D	A	B	C	D
Turbellaria	-	-	-	-	1(-)	1(-)	-	-
Nemertinea	-	-	1(-)	-	1(-)	3(-)	6(0.9)	1(-)
Nematoda	1(-)	5(0.4)	3(-)	4(-)	2(-)	1(-)	1(-)	1(-)
Manayunkia speciosa	-	-	-	-	-	-	-	1(-)
Branchiura sowerbyi	-	-	-	-	1(-)	-	-	-
Limnodrilus claparedeianus	-	12(6.1)	-	-	-	-	10(2.5)	-
L. hoffmeisteri	20(7.9)	23(11.6)	21(2.8)	-	-	10(1.7)	21(5.3)	22(8.2)
L. udekemi mag	-	12(6.1)	-	10(3.2)	10(1.6)	-	-	22(8.2)
Limnodrilus spp.	88(34.9)	92(46.6)	196(25.7)	88(28.0)	143(23.1)	164(28.3)	105(26.2)	21(6.2)
Imm. tub./cap. chaetae*	-	1(-)	-	-	1(-)	-	1(-)	-
Gammarus fasciatus	-	1(-)	1(0.4)	1(-)	-	1(-)	2(-)	-
Hexagenia limbata	1(3.7)	1(10.3)	-	1(3.7)	-	-	-	-
Protoptila sp.	-	-	-	-	-	1(-)	-	-
Cheumatopsyche sp.	-	-	-	3(0.2)	-	-	-	-
Hydropsyche bifida group sp.	-	-	-	1(-)	-	-	-	-
H. phalerata	-	-	-	1(-)	-	-	-	-
Dubiraphia sp.	-	1(-)	-	-	-	-	-	-
Procladius sp.	-	-	-	2(-)	-	-	-	-
Eukiefferiella sp. A	-	1(-)	-	-	-	-	-	-
Cricotopus spp.	4(-)	2(-)	-	2(-)	-	-	-	-
Orthocladius (Orthocladius) sp.	1(-)	-	-	2(-)	-	-	-	-
Psectrocladius sp.	1(-)	-	-	1(-)	-	-	-	-
Chironomus decorus	32(12.5)	95(31.4)	106(32.5)	88(24.9)	-	1(-)	-	1(-)
Cryptochironomus nr. blarina	-	-	-	-	-	-	1(-)	-
Dicrotendipes modestus	1(-)	2(-)	1(-)	7(-)	-	-	-	-
Paracladopelma sp.	-	-	1(-)	2(-)	-	-	-	-
Rheotanytarsus sp.	1(-)	2(-)	-	-	-	-	-	-
Tanytarsus sp.	-	1(-)	-	1(-)	-	-	-	-
Physa sp.	-	-	-	-	6(-)	12(-)	15(-)	4(-)
Lymnaea sp.	-	-	-	-	3(-)	4(-)	2(-)	-
Gyraulus parvus	-	-	-	-	-	7(-)	8(-)	4(-)
Ferrissia spp.	1(-)	-	-	-	65(14.8)	267(-)	134(-)	135(-)
Conichasis virginica	2(73.1)	1(208.8)	2(74.3)	2(123.8)	-	3(70.0)	1(66.7)	-
Spirodon carinata	-	-	-	-	-	1(-)	-	-
Pisidium sp.	8(-)	9(-)	16(-)	5(-)	28(-)	32(-)	39(-)	13(-)
Sphaerium sp.	2(-)	4(-)	3(-)	1(-)	52(-)	80(59.2)	68(35.3)	46(-)

* Immature Tubificid with capilliform chaetae.

1565 166

Table 3.2-8

Numbers and milligrams of biomass, ash (mg), of benthic organisms per Ponar grab (529 cm^2) at Station TM-AQ1-1A2, April 1976. Dashes indicate species not present or no weight measurement made.

Date	6 April				20 April			
Time	0950				0950			
Air Temp. (C)	16.5				24.0			
Water Temp. (C)	8.0				21.0			
Dissolved Oxygen (ppm)	9.7				8.1			
pH	8.4				7.9			
Secchi Disc (cm)	38.1				114.3			
River Stage (ft)	6.6				4.7			
Substrate	Sand, Coal, Mud, Detritus				Mud, Sand, Coal, Detritus			
Replicate	A	B	C	D	A	B	C	D
Nematoda	-	1(-)	1(-)	-	2(-)	1(-)	3(-)	1(-)
Nais bretscheri	-	-	-	-	-	1(-)	1(-)	-
N. elinguis	-	-	5(-)	-	6(-)	-	1(-)	2(-)
N. variabilis	-	-	-	-	-	1(-)	3(-)	-
Branchiura sowerbyi	-	-	-	-	-	-	1(-)	-
Limnodrilus claparedeianus	-	-	-	-	-	3(1.2)	-	-
L. hoffmeisteri	-	22(7.3)	3(-)	-	21(5.3)	3(1.2)	-	-
L. udekemianus	-	32(10.6)	1(-)	-	-	-	8(2.4)	-
Lignodrilus spp.	29(9.0)	-	11(-)	28(7.5)	-	12(-.9)	2(0.6)	22(5.2)
Peloscolex multisetosus	-	-	-	-	1(-)	1(-)	-	-
Tubifex tubifex	-	-	-	-	-	2(-)	-	-
Imm. tub./cap. chaetae*	9(2.8)	-	3(-)	-	-	1(-)	10(2.6)	13(6.2)
Megadrile	1(-)	-	-	-	-	-	-	-
Gammarus fasciatus	-	-	-	-	8(15.0)	-	-	-
Cryptochironomus nr. fulvus	-	-	-	1(-)	-	-	-	-
Chironomus nr. obediens	-	-	-	-	-	-	1(-)	-
Corbicula virginica	7(137.2)	3(55.9)	20(549.7)	5(100.0)	2(38.0)	5(233.7)	7(180.7)	3(115.0)
Pisidium sp.	-	-	-	-	1(-)	-	-	-
Sphaerium sp.	-	-	-	1(-)	-	-	-	-

* Immature tubificid with capilliform chaetae.

POOR ORIGINAL

1565 167

POOR ORIGINAL

Table 3.2-9

Numbers and milligrams of biomass, = (mg), of benthic organisms per Ponar grab (529 cm^2) at Station TM-AQI-1A2, May 1976. Dashes indicate species not present or no weight measurement made.

Date	4 May				18 May			
Time	0959				1028			
Air Temp. (C)	NA				19.0			
Water Temp. (C)	11.8				19.8			
Dissolved Oxygen (ppm)	8.9				7.0			
pH	7.8				NA			
Secchi Disc (cm)	71.1				45.7			
River Stage (ft)	4.9				4.6			
Substrate	Mud, Sand, Coal, Detritus				Mud, Sand, Some Coal, Detritus			
Replicate	A	B	C	D	A	B	C	D
Turbellaria	-	-	1(-)	-	-	-	-	-
Nematoda	1(-)	-	2(-)	3(-)	2(-)	-	-	1(-)
Aulophorus furcatus	-	-	-	-	1(-)	-	-	-
Chaetogaster diaphanus	-	-	-	-	75(-)	63(1.7)	88(-)	-
Nais bretscheri	-	-	-	-	8(0.2)	-	-	-
N. elinguis	36(0.5)	27(-)	3(-)	39(0.6)	7(0.2)	6(-)	-	64(1.2)
N. variabilis	9(0.1)	7(-)	-	13(0.2)	-	-	19(-)	48(0.9)
Nais sp.	-	3(-)	1(-)	-	-	-	-	-
Ophidonais serpentina	-	-	-	-	11(0.2)	2(-)	-	-
Paranais frici	-	-	-	-	3(0.1)	-	-	-
Slavina appendiculata	-	-	-	-	3(0.1)	1(-)	6(-)	-
Aulodrilus pluriseta	-	-	-	-	-	1(-)	-	-
Branchiura sowerbyi	-	1(-)	-	-	-	-	-	-
Ilyodrilus templetoni	-	-	-	-	-	-	1(-)	-
Limnodrilus hoffmeisteri	-	53(15.8)	1(-)	10(3.0)	11(1.1)	54(25.1)	2(-)	15(1.7)
Limnodrilus spp.	39(8.0)	43(12.8)	4(-)	19(5.8)	99(10.0)	-	8(-)	262(30.3)
Peloscolex multisetosus	-	-	-	-	6(-)	-	1(-)	2(-)
Tubifex tubifex	1(-)	-	-	-	2(-)	10(-)	-	2(-)
imm. tub./cap. chaetae*	1(-)	-	-	-	2(-)	1(-)	2(-)	1(-)
Megadrile	-	-	-	1(-)	-	-	-	-
Gammarus fasciatus	-	-	-	-	1(-)	-	2(-)	-
Cheumatopsyche sp.	-	-	-	1(-)	-	-	-	-
Stenelmis sp.	-	-	-	-	-	-	-	1(-)
Procladius sp.	-	-	-	-	14(7.3)	8(1.7)	6(-)	18(5.1)
Procladius sp. pupa	-	-	-	-	-	-	-	1(-)
Psectrotanypus sp.	-	-	-	-	-	2(0.4)	-	-
Cricotopus spp.	-	-	-	-	1(-)	2(0.4)	-	-
Cricotopus spp. pupa	-	-	-	-	-	-	1(-)	-
Orthocladius (Orthocladius) sp.	-	-	-	5(-)	-	-	-	-
Psectrocladius sp.	4(0.4)	-	-	2(-)	-	-	-	-
Chironomus decorus	7(0.7)	1(-)	-	9(0.9)	48(19.8)	16(5.4)	17(5.5)	38(42.4)
C. decorus pupa	-	-	-	1(-)	1(1.5)	-	-	3(4.9)
Phaenopsectra nr. obediens	-	-	-	-	-	2(0.4)	-	-
Physa sp.	-	-	-	-	-	-	1(-)	-
Goniobasis virginica	2(3.9)	2(46.6)	5(206.8)	4(117.6)	2(134.6)	1(11.7)	7(256.1)	-
Pisidium sp.	-	1(-)	1(-)	-	-	-	-	-
Sphaerium sp.	1(-)	-	-	-	-	-	-	-

NA = Not Available.

* Immature tubificid with capilliform chaetae.

1565 168

POOR ORIGINAL

Table 3.2-10

Numbers and milligrams of biomass, = (mg), of benthic organisms per Ponar grab (529 cm^2) at Station TM-AQI-1A2, June 1976. Dashes indicate species not present or no weight measurement made.

Date	1 June				15 June			
Time	0837				0805			
Air Temp. (C)	21.5				24.0			
Water Temp. (C)	19.0				23.0			
Dissolved Oxygen (ppm)	9.2				7.2			
pH	8.3				8.0			
Secchi Disc (cm)	76.2				45.7			
River Stage (ft)	5.1				4.1			
Substrate	Coal, Sand, Mud, Detritus				Mud, Detritus			
Replicate	A	B	C	D	A	B	C	D
Nematoda	8(-)	9(-)	1(-)	3(-)	6(-)	3(-)	1(-)	9(0.4)
Arctonais lomondi	-	-	-	-	-	1(-)	-	-
Nais elinguis	2(-)	-	-	2(-)	-	-	-	-
N. variabilis	2(-)	-	-	3(-)	-	-	-	-
Ilyodrilus templetoni	1(-)	-	-	-	-	-	-	-
Limnodrilus claparedeianus	-	31(6.0)	-	-	30(7.5)	-	-	10(1.4)
L. hoffmeisteri	11(2.3)	153(29.4)	46(5.6)	66(16.6)	30(7.5)	39(16.5)	80(18.1)	30(4.2)
Limnodrilus spp.	55(11.6)	185(35.6)	57(6.9)	98(24.7)	61(15.3)	39(16.5)	159(35.9)	49(6.9)
Peloscolex multisetosus	1(-)	1(-)	-	2(-)	2(-)	5(-)	2(0.2)	4(-)
Tubifex tubifex	3(-)	5(-)	3(-)	4(-)	-	2(0.2)	-	2(-)
imm. tub./cap. chaetae*	4(-)	2(-)	-	4(-)	2(-)	17(1.7)	2(-)	5(-)
Gammarus fasciatus	-	-	-	-	-	-	1(-)	-
Hydropsyche sp.	1(-)	-	-	-	-	-	-	-
Dubiraphia sp.	-	-	-	-	1(-)	-	-	-
Stenelmis spp.	2(1.3)	-	-	1(1.0)	-	-	-	1(0.4)
Procladius sp.	10(2.7)	3(-)	4(-)	3(-)	6(2.2)	31(5.1)	7(1.6)	5(1.7)
Psectrocanypus sp.	-	-	1(-)	-	-	-	-	-
Chironomus decorus	9(7.8)	14(25.2)	2(-)	18(6.1)	374(144.2)	251(85.4)	285(119.7)	220(98.6)
C. decorus pupa	-	2(-)	-	1(-)	2(1.3)	1(1.4)	-	-
Chaenopsectra nr. obediens	1(-)	-	-	-	6(1.1)	10(0.7)	1(-)	-
Polypedilum nr. illinoense	-	-	-	-	-	2(0.1)	-	-
Palpomyia group sp. pupa	-	-	-	-	-	1(-)	-	-
Zoniobasis virginica	-	2(67.5)	2(44.4)	3(76.6)	1(65.2)	3(88.7)	6(243.2)	1(38.1)
Pisidium sp.	1(-)	-	-	-	-	-	-	-

* Immature tubificid with capilliform chaetae.

1565 169

POOR ORIGINAL

Table 3.2-11

Numbers and milligrams of biomass, dry (mg), of benthic organisms per Ponar grab (529 cm^2) at Station TM-AQI-1A2, July 1976. Dashes indicate species not present or no weight measurement made.

Date	6 July				20 July			
Time	0825				0817			
Air Temp. (C)	23.0				22.0			
Water Temp. (C)	24.0				24.0			
Dissolved Oxygen (ppm)	NA				7.3			
pH	8.0				8.2			
Secchi Disc (cm)	58.4				30.5			
River Stage (ft)	4.7				4.3			
Substrate	Mud, Sand, Coal, Detritus				Mud, Detritus, Sand			
Replicate	A	B	C	D	A	B	C	D
Nematoda	10(0.7)	3(-)	2(-)	-	-	-	3(0.1)	3(-)
Branchiura sowerbyi	-	-	-	1(-)	-	-	-	-
Ilyodrilus templetoni	1(-)	-	-	-	-	1(-)	-	-
Limnodrilus claparedeianus	-	10(2.0)	9(1.3)	-	-	-	-	-
L. hoffmeisteri	21(3.8)	10(2.0)	27(4.0)	55(7.0)	32(5.5)	30(6.7)	57(5.7)	67(7.9)
Limnodrilus spp.	82(14.7)	174(35.0)	133(19.7)	86(11.2)	138(23.7)	179(40.1)	288(28.8)	270(31.8)
Peloscolex multisetosus	3(-)	-	-	1(-)	-	-	-	1(-)
Tubifex tubifex	-	2(0.2)	-	-	-	-	-	-
Imm. tub./cap. chaetae*	6(-)	10(0.8)	5(-)	1(-)	1(-)	7(-)	3(-)	4(-)
Helobdella elongata	-	-	-	-	-	1(0.8)	-	-
Optioservus sp.	-	-	1(0.6)	-	-	-	-	-
Procladius sp.	7(-)	4(-)	1(-)	1(-)	17(6.8)	19(1.9)	13(2.3)	5(-)
Abiabesmyia sp.	-	-	-	-	4(2.0)	1(-)	-	1(-)
Chironomus decorus	115(8.2)	136(10.3)	138(11.5)	114(13.2)	20(13.4)	17(14.1)	42(20.8)	24(13.9)
C. decorus pupa	-	1(1.1)	-	-	1(-)	-	1(-)	-
Paracladopelma sp.	-	-	2(-)	-	-	-	-	-
Polypedilum halterale	-	-	-	-	2(1.0)	-	-	-
P. nr. illinoense	-	-	-	-	-	2(-)	-	-
Palpomyia group sp.	-	-	-	-	1(-)	-	1(-)	-
Goniobasis virginica	-	2(101.6)	1(46.9)	-	-	-	-	-
Pisidium sp.	-	-	-	-	-	2(-)	-	1(-)
Sphaerium sp.	-	2(1.7)	-	-	-	-	-	-

NA = Not Available.

* Immature tubificid with capilliform chaetae.

1565 170

Table 3.2-12

Numbers and milligrams of biomass, * (mg), of benthic organisms per Ponar grab (529 cm^2) at station TM-AQI-1A2, August 1976. Dashes indicate species not present or no weight measurement made.

Date	3 August				17 August			
Time	0848				0842			
Air Temp. (C)	21.0				20.0			
Water Temp. (C)	21.0				18.0			
Dissolved Oxygen (ppm)	7.7				7.9			
pH	8.0				8.0			
Secchi Disc (cm)	45.7				15.2			
River Stage (ft)	4.1				4.5			
Substrate	Coal, Sand, Mud, Detritus				Mud, Detritus, Some Sand, Coal			
Replicate	A	B	C	D	A	B	C	D
Nematoda	-	-	2(-)	3(-)	2(-)	1(-)	4(0.6)	4(-)
Limnodrilus cervix	10(2.0)	-	-	-	-	-	-	-
L. hoffmeisteri	31(6.1)	31(5.4)	42(7.4)	46(9.2)	32(6.3)	115(20.6)	40(6.4)	57(11.2)
Limnodrilus spp.	52(10.2)	216(37.8)	218(38.2)	104(20.9)	84(16.5)	94(16.8)	100(16.1)	182(35.9)
Peloscolex multisetosus	-	2(0.4)	-	-	-	-	-	-
Tubifex tubifex	-	-	-	-	1(-)	-	-	-
Imm. tub./cap. chaetae*	3(-)	3(-)	3(-)	3(-)	2(-)	-	12(0.9)	9(1.1)
Helobdella spp.	-	-	-	-	-	1(-)	-	-
Orconectes spp.	-	-	-	-	-	-	-	1(-)
Promoresia sp.	-	-	-	1(-)	-	-	-	-
Stenelmis spp.	-	-	-	-	-	1(0.4)	-	-
Procladius sp.	6(0.5)	25(2.9)	21(2.8)	12(1.6)	20(3.1)	30(6.0)	28(3.4)	26(4.8)
Ablabesmyia sp.	-	-	-	1(-)	-	-	-	-
Chironomus decorus	69(20.3)	109(32.8)	159(29.5)	138(30.5)	47(19.5)	53(36.3)	79(38.7)	94(48.3)
C. decorus pupa	-	1(-)	3(-)	2(-)	2(-)	1(-)	3(-)	-
Cryptochironomus nr. fulvus	2(0.2)	2(-)	-	1(-)	-	-	-	-
Paracladopelma sp.	-	1(-)	3(0.4)	-	-	-	-	-
Goniobasis virginica	2(143.1)	3(198.3)	1(30.1)	-	-	3(3.6)	5(238.3)	3(118.6)
Pisidium sp.	-	-	-	-	-	-	2(-)	-

* Immature tubificid with capilliform chaetae.

POOR ORIGINAL

1565 171

POOR ORIGINAL

Table 3 13

Numbers and milligrams of biomass, " (mg), of benthic organisms per Ponar grab (529 cm^2) at Station TM-AQI-1A2, September 1976. Dashes indicate species not present or no weight measurement made.

Date	7 September				21 September			
Time	0830				0840			
Air Temp. (C)	14.5				18.0			
Water Temp. (C)	19.0				19.0			
Dissolved Oxygen (ppm)	9.0				8.0			
pH	8.0				8.0			
Secchi Disc (cm)	33.0				30.5			
River Stage (ft)	3.5				4.1			
Substrate	Mud, Detritus, Coal				Mud, Detritus			
Replicate	A	B	C	D	A	B	C	D
Nemertinea	-	-	-	-	-	1(-)	-	-
Nematoda	-	1(-)	1(-)	1(-)	-	-	-	1(-)
Limnodrilus claparedeianus	-	-	-	-	13(2.4)	-	-	17(2.1)
L. hoffmeisteri	81(9.1)	72(10.2)	34(5.2)	73(9.9)	51(9.3)	21(3.2)	144(20.6)	17(2.1)
L. udekemianus	-	14(2.0)	-	-	-	-	-	17(2.1)
Limnodrilus spp.	322(36.0)	273(38.8)	253(38.5)	381(51.9)	254(46.5)	230(35.5)	529(75.7)	367(44.6)
Peloscolex multisetosus	-	-	-	-	1(-)	-	-	1(-)
imm. tub./cap. chaetae*	3(-)	-	-	-	-	4(-)	7(-)	4(-)
Helobdella elongata	-	-	-	1(0.5)	-	-	-	-
Helobdella sp.	-	-	-	1(-)	-	-	-	-
Hexagenia limbata	-	-	-	1(3.0)	-	-	1(19.4)	1(6.5)
Procladius sp.	12(1.9)	25(3.4)	15(2.7)	22(3.0)	5(-)	12(3.9)	9(2.5)	9(2.1)
Chironomus decorus	68(18.8)	69(11.0)	41(8.1)	37(7.7)	27(8.1)	20(7.1)	28(8.4)	28(9.0)
C. decorus pupa	-	-	-	-	-	1(-)	1(-)	1(-)
Cryptochironomus nr. fulvus	-	3(-)	1(-)	2(-)	-	-	-	-
Paracladopelma sp.	-	-	1(-)	-	-	-	-	-
Gonichasis virginica	3(96.0)	2(142.3)	1(92.4)	2(58.9)	3(120.2)	5(215.4)	3(218.4)	2(211.7)
Pisidium sp.	4(-)	-	1(-)	-	1(-)	-	-	-

* Immature tubificid with capilliform chaetae.

1565 172

Table 3.2-14

Numbers and milligrams of biomass, " (mg), of benthic organisms per Ponar grab (529 cm²) at station [illegible]AQI-1A2, October 197[illegible]. Dashes indicate species not present or no weight measurement made.

Date	5 October				1[illegible] October			
Time	0830				0845			
Air Temp. (C)	13.0				3.[illegible]			
Water Temp. (C)	15.5				9.[illegible]			
Dissolved Oxygen (ppm)	9.4				11.[illegible]			
pH	8.0				7.[illegible]			
Secchi Disc (cm)	27.9				30.[illegible]			
River Stage (ft)	4.8				5.[illegible]			
Substrate	Mud, Detritus, Some Sand				Sand, Coal, [illegible], Detritus			
Replicate	A	B	C	D	A	B	C	D
Turbellaria	-	-	-	-	-	-	-	1(-)
Nemertinea	-	-	-	-	2(-)	-	-	-
Pleuratella repens	-	-	-	*	-	-	-	-
Nais[illegible]tilus templetoni	-	1(-)	-	-	-	-	-	-
Limnodrilus cervix	-	-	-	10(2.8)	-	-	-	-
L. claparedeianus	-	-	10(2.8)	-	-	-	-	-
L. hoffmeisteri	17(2.9)	20(6.9)	39(11.1)	41(8.5)	10(1.6)	-	22(6.7)	18(2.1)
L. udekemianus	-	-	-	-	-	-	11(3.4)	37(7.8)
Limnodrilus spp.	390(67.1)	109(66.8)	178(50.6)	174(36.3)	59(9.5)	59(10.7)	179(60.2)	364(80.7)
Peloscolex multisetosus	-	-	-	1(-)	-	-	-	-
Imm. tub./cap. chaetae**	-	2(-)	2(-)	2(-)	-	-	-	-
Tubificus fasciatus	-	-	-	-	3(0.1)	16(5.4)	24(-)	26(4.9)
Collembola	-	-	-	-	-	-	-	1(-)
Hexagenia limbata	-	-	-	-	1(1.7)	-	-	2(26.9)
Corydalus spiniceps	-	-	-	-	-	-	2(30.1)	-
Corixidae	-	-	-	-	-	-	-	1(-)
Hydropsyche phalerata	-	-	-	-	-	1(0.9)	-	2(0.7)
Tubificinia sp.	-	-	-	-	-	-	-	1(-)
Stenelmis spp.	-	-	1(0.5)	-	-	-	-	-
Chauliodes punctipennis	1(0.3)	-	-	-	-	-	-	-
Prodiaitus sp.	3(-)	3(-)	2(-)	8(1.1)	-	-	-	-
Chironomus decorus	10(3.2)	13(3.6)	14(4.6)	11(2.4)	1(-)	-	14(-)	1(-)
Cryptochironomus nr. fulvus	-	-	-	-	-	1(-)	-	1(-)
Glyptotendipes sedestus	-	1(-)	-	-	-	-	-	-
Paratendipes group sp.	-	1(-)	-	-	-	-	-	-
Physa sp.	-	-	-	-	-	1(-)	1(-)	-
Ferrissia spp.	-	-	-	-	8(-)	193(-)	7(-)	1(-)
Gonidiatis virginica	4(198.2)	3(146.1)	-	2(34.8)	-	1(-)	-	-
Pisidium sp.	3(-)	-	-	1(-)	-	7(-)	-	-
Sphaerium sp.	-	-	-	1(-)	5(-)	13(-)	1(-)	1(-)

* Quantization not possible; denotes organism present.

** Immature tubificid with capilliform chaetae.

POOR ORIGINAL

1565 173

Table 3.2-15

Numbers and milligrams of biomass, # (mg), of benthic organisms per Ponar grab (529 cm^2) at Station TM-AQI-11A1, April 1976. Dashes indicate species not present or no weight measurement made.

Date	6 April				20 April			
Time	1045				1004			
Air Temp. (C)	19.0				24.5			
Water Temp. (C)	8.0				20.5			
Dissolved Oxygen (ppm)	10.3				7.9			
pH	8.4				7.7			
Secchi Disc (cm)	30.5				61.0			
River Stage (ft)	6.6				4.7			
Substrate	Mud, Detritus, Some Coal				Mud, Detritus, Coal			
Replicate	A	B	C	D	A	B	C	D
Turbellaria	-	-	-	-	1(0.3)	-	-	1(0.8)
Nemertinea	-	-	2(-)	-	-	-	-	-
Ilyodella gracilis	-	-	-	-	*	-	-	-
Naididae bretscheri	-	-	2(-)	-	1(-)	-	-	-
Limnodrilus claparedeianus	-	1(-)	-	-	12(4.7)	1(-)	-	11(8.7)
L. hoffmeisteri	3(2.0)	8(-)	3(-)	1(-)	12(4.7)	5(-)	91(51.7)	-
L. udekemianus	-	2(-)	2(-)	-	-	1(-)	-	-
Limnodrilus spp.	20(13.3)	6(-)	3(-)	4(-)	25(9.8)	5(-)	-	22(17.4)
Peloscolex multisetosus	-	-	-	-	-	4(1.6)	2(0.8)	-
Imm. tub./cap. chaetae**	-	-	-	1(-)	-	2(-)	-	-
Helobdella elongata	-	-	-	-	-	-	1(0.8)	-
H. lineata	-	-	-	-	1(-)	-	-	-
Erpobdellidae	-	1(-)	-	-	-	-	-	3(20.4)
Dero sebdella microstoma	-	-	-	-	2(21.1)	-	-	-
Orthocladius (Orthocladius) sp.	-	-	-	-	1(-)	-	-	-
Cryptochironomus nr. fulvus	-	-	-	-	-	-	1(-)	-
Phaenopsectra nr. obediens	-	-	-	-	-	1(-)	-	-
Goniobasis virginica	-	-	-	-	10(357.0)	4(15.8)	-	3(103.9)
Amnicola limosa	-	-	-	-	-	2(-)	-	-
Pisidium sp.	-	-	-	-	1(-)	-	-	-
Sphaerium sp.	-	-	-	-	3(-)	2(-)	-	-

* Quantization not possible; denotes organism present.
** Immature tubificid with capilliform chaetae.

POOR ORIGINAL

1565 174

Table 3.2-16

Numbers and milligrams of biomass, wet (mg), of benthic organisms per Ponar grab (529 cm²) at Station ZM-MQI-11A1, May 1976. Dashes indicate species not present or no weight measurement made.

Date	4 May				18 May			
Time	1024				1[illegible]			
Air Temp. (C)	NA				1[illegible]			
Water Temp. (C)	11.8				1[illegible]			
Dissolved Oxygen (ppm)	10.0				[illegible]			
pH	7.7				[illegible]			
Secchi Disc (cm)	63.5				1[illegible]			
River Stage (ft)	4.9				[illegible]			
Substrate	Mud, Detritus, Some Coal				Mud, Detritus, Some Sand			
Replicates	A	B	C	D	A	B	C	D
Nemertinea	-	2(-)	-	2(-)	-	-	-	-
Nematoda	5(0.2)	-	2(-)	3(-)	1(-)	1(-)	2(-)	2(-)
Chaetogaster diaphanus	-	-	-	-	-	-	-	1(-)
Nais bretscheri	1(-)	2(-)	3(-)	3(-)	-	2(-)	1(-)	3(-)
N. elinguis	2(-)	5(-)	2(-)	5(-)	3(-)	3(-)	6(-)	3(-)
N. variabilis	-	-	-	1(-)	-	-	-	-
Paranais frici	-	1(-)	-	-	-	-	-	-
Slavina appendiculata	-	-	-	-	-	-	-	1(-)
Limnodrilus hoffmeisteri	11(1.0)	4(0.3)	4	-	12(16.2)	16(1.[illegible]	45(3.2)	-
L. udekemianus	-	-	-	6(0.8)	-	-	-	32(3.8)
Limnodrilus spp.	95(8.2)	17(1.4)	42(3.0)	24(3.2)	285(93.9)	372([illegible].2)	703(81.4)	915(109.0)
Peloscolex multisetosus	2(0.2)	-	-	1(-)	-	-	-	-
Imm. tub./cap. chaetae*	-	-	-	1(-)	-	-	2(-)	-
Helobdella elongata	1(0.8)	-	-	1(1.9)	-	-	-	-
Erpobdellidae	-	2(1.3)	-	1(0.4)	4(-)	4(7.4)	-	-
Mooreobdella microstoma	-	-	1(-)	-	-	-	-	-
Gammarus fasciatus	7(0.4)	9(1.0)	8(0.9)	27(2.4)	1(-)	7(2.1)	6(0.8)	2(-)
Stenelmis spp.	-	1(0.1)	-	-	-	-	-	-
Psychoda sp. pupa	1(-)	-	-	-	-	-	-	-
Tolmatoscopus sp. pupa	-	-	-	1(0.3)	-	-	-	-
Procladius sp.	-	-	-	-	3(-)	-	-	2(-)
Tricotopus spp.	1(-)	-	-	1(-)	-	-	-	1(-)
Orthocladius (Orthocladius) sp.	4(-)	-	-	-	-	-	-	-
Chironomus decorus	2(-)	2(-)	3(-)	4(-)	15(7.5)	20(8.3)	6(-)	14(8.0)
C. decorus pupa	-	-	-	-	-	1(-)	-	-
Cryptochironomus nr. fulvus	-	-	1(-)	-	-	-	-	-
Phaenopsectra nr. obediens	-	-	-	-	-	-	-	2(-)
Polypedilum nr. illinoense	1(-)	-	-	-	-	-	-	2(-)
Empididae	-	-	1(-)	-	-	-	-	-
Coniohasis virginica	1(7.7)	-	2(123.2)	3(108.9)	-	-	2(102.4)	1(36.9)
Pisidium sp.	-	1(-)	2(-)	-	-	-	-	-
Sphaerium sp.	-	3(0.3)	2(2.5)	3(6.3)	-	-	-	-

NA = Not Available

* Immature tubificid with capilliform chaetae.

POOR ORIGINAL

Table 3.2-17

Numbers and milligrams of biomass, dry (mg), of benthic organisms per Ponar grab (529 cm²) at Station EH-AQI-11A1, June 1976. Dashes indicate species not present or no weight measurement made.

Date	1 June				15 June			
Time	0650				0820			
Air Temp. (°C)	22.5				23.0			
Water Temp. (°C)	19.5				23.0			
Dissolved Oxygen (ppm)	9.6				7.7			
pH	8.6				8.0			
Secchi Disc (cm)	63.5				35.6			
River Stage (ft)	5.1				4.1			
Substrate	Mud, Detritus, Some Coal				Mud, Detritus, Some Sand, Some Gravel			
Replicate	A	B	C	D	A	B	C	D
Turbellaria	-	-	-	1(0.3)	-	1(-)	-	1(-)
Nemertinea	1(-)	1(0.5)	-	-	-	1(-)	-	-
Plumatella repens	-	P*	P	P	-	-	P	P
Nematoda	6(-)	6(-)	11(-)	7(-)	9(1.1)	8(-)	15(1.1)	23(2.5)
Arctopsais lacustri	-	-	-	1(-)	-	-	-	-
Mais pretaschei	3(-)	7(-)	3(-)	1(-)	-	-	1(-)	1(-)
N. elinguis	5(-)	1(-)	-	1(-)	-	-	1(-)	-
N. variabilis	-	-	-	1(-)	-	-	-	-
Paranais frici	-	1(-)	-	-	-	-	-	-
Slavina appendiculata	1(-)	-	-	1(-)	-	-	-	-
Limnodrilus cervicalis	-	13(3.1)	-	-	-	-	-	-
L. hoffmeisteri	212(17.5)	81(19.3)	69(10.6)	147(25.3)	222(16.0)	116(15.0)	185(30.3)	109(27.5)
Limnodrilus spp.	492(84.3)	229(54.3)	359(66.4)	159(27.3)	287(40.9)	559(72.3)	278(57.6)	324(58.9)
Peloscolex multisetosus	2(-)	-	3(0.7)	5(0.9)	-	-	1(-)	2(.5)
Tubifex tubifex	2(-)	-	-	-	-	-	-	-
Imm. tub./cap. chaetae**	-	13(3.1)	2(-)	-	-	-	-	3(-)
Helobdella elongata	2(0.9)	1(2.8)	1(1.1)	-	1(0.1)	15(6.0)	5(2.4)	8(0.9)
Helobdella sp.	-	-	-	2(3.6)	-	-	-	-
Erpobdellidae	1(0.6)	3(0.9)	2(18.8)	1(-)	2(1.1)	7(7.0)	6(25.7)	6(3.2)
Mooreobdella microstoma	-	-	-	2(24.2)	-	-	-	-
Gammarus fasciatus	9(9.7)	5(0.6)	8(4.1)	33(18.5)	27(5.7)	90(26.4)	61(14.2)	72(15.9)
Hexagenia limbata	-	-	-	-	-	1(-)	-	-
Ceraclea transmontata	-	-	-	-	-	-	1(-)	-
Gomphus spinicornis	-	-	1(123.6)	-	1(152.0)	-	-	-
Stenelmis sp.	1(0.5)	1(1.4)	-	1(1.4)	-	3(3.3)	2(1.7)	1(0.8)
Procladius sp.	-	-	1(-)	-	2(0.4)	3(0.9)	5(-)	6(-)
Ablabesmyia mallochi	-	-	-	-	-	-	1(-)	-
Orthocladius (Orthocladius) sp.	-	1(-)	-	-	-	-	-	-
Psectrocladius sp.	-	-	-	1(-)	-	-	-	2(-)
Chironomus decorus	2(-)	3(-)	3(-)	3(-)	10(2.3)	11(2.8)	35(6.0)	42(7.1)
C. decorus pupa	-	-	3(2.8)	-	-	-	-	-
Cryptochironomus nr. fulvus	-	1(-)	-	-	6(0.9)	9(0.5)	7(-)	3(-)
C. nr. fulvus pupa	-	-	-	-	-	1(-)	-	-
Glyptotendipes sp.	-	-	1(-)	-	-	-	-	-
Harnischia sp. pupa	-	-	-	-	-	-	-	-
Paracladopelma sp.	-	1(-)	-	-	-	1(-)	-	-
Phaenopsectra nr. obediens	3(-)	-	7(-)	1(-)	5(0.8)	16(0.8)	5(-)	12(-)
P. nr. obediens pupa	-	-	-	1(-)	-	-	-	-
Polypedilum halterale	-	-	1(-)	-	2(0.1)	3(0.1)	3(-)	3(-)
Polypedilum sp.	-	1(-)	-	-	-	-	-	-
Rheotanytarsus sp.	-	-	-	-	-	-	-	1(-)
Tanytarsus sp.	1(-)	3(-)	1(-)	2(-)	4(0.2)	2(0.2)	8(-)	2(-)
Tanytarsus sp. pupa	-	-	-	-	-	-	-	1(-)
Simulium sp.	-	1(-)	-	-	-	-	-	-
Physa sp.	-	-	-	-	-	-	1(-)	-
Goniobasis virginica	-	3(62.8)	1(36.9)	2(46.7)	1(57.6)	8(293.6)	9(516.6)	9(425.4)
Pisidium sp.	1(-)	1(-)	2(-)	1(-)	-	-	3(-)	1(-)
Sphaerium sp.	1(-)	9(16.3)	1(4.4)	4(13.8)	8(21.9)	9(18.0)	2(-)	7(-)

* Quantization not possible; denotes organism present.
** Immature tubificid with capilliform chaetae.

1565 176

POOR ORIGINAL

Table 3.2-18

Numbers and milligrams of biomass, ash (mg), of benthic organisms per Ponar grab (529 cm^2) at Station TM-AQI-11A1, July 1976. Dashes indicate species not present or no weight measurement made.

Date	6 July				20 July			
Time	0840				0835			
Air Temp. (C)	23.5				23.0			
Water Temp. (C)	24.5				24.5			
Dissolved Oxygen (ppm)	NA				8.2			
pH	8.0				8.5			
Secchi Disc (cm)	25.4				15.2			
River Stage (ft)	4.7				4.3			
Substrate	Mud, Sand, Coal, Detritus				Mud, Sand, Coal, Detritus			
Replicate	A	B	C	D	A	B	C	D
Turbellaria	1(-)	-	1(0.3)	-	-	-	2(0.4)	3(4.1)
Nematoda	12(0.7)	11(0.5)	10(0.1)	9(1.0)	-	6(-)	5(-)	2(-)
Urnatella gracilis	-	P*	-	-	-	P	-	-
Limnodrilus hoffmeisteri	99(15.3)	10(1.8)	58(11.1)	60(14.8)	29(7.6)	68(10.6)	40(4.6)	77(14.4)
L. udekemianus	12(1.8)	-	-	10(2.5)	-	-	-	-
Limnodrilus spp.	197(30.4)	234(42.9)	138(26.5)	120(29.5)	138(36.2)	216(33.8)	159(18.2)	308(57.5)
Peloscolex multisetosus	1(-)	-	1(-)	-	-	1(-)	-	-
Helobdella elongata	5(2.6)	7(..9)	16(6.4)	5(2.6)	4(2.2)	7(2.)	-	9(11.8)
Erpobdellidae	3(9.6)	4(17.8)	14(30.1)	-	5(24.2)	7(26.8)	1(0.6)	2(34.2)
Gammarus fasciatus	1(0.1)	3(0.3)	12(5.9)	-	-	-	-	-
Cocetis sp.	1(-)	-	-	-	-	-	-	-
Procladius sp.	-	-	-	1(-)	-	1(-)	-	5(1.3)
Chironomus decorus	-	1(-)	-	-	-	5(-)	7(1.0)	2(0.2)
Cryptochironomus nr. blarina	-	-	-	-	-	-	-	2(0.4)
C. nr. fulvus	7(1.0)	5(2.6)	5(0.6)	6(-)	-	3(-)	9(1.2)	17(3.3)
Paracladopelma sp.	2(-)	-	4(0.5)	-	-	-	-	4(0.5)
Phaenopsectra nr. obediens	-	-	-	1(-)	-	-	-	-
Polypedilum halterale	-	-	-	-	-	-	2(0.3)	-
P. scalaenum	-	-	-	-	-	1(-)	4(0.5)	-
Conichusia virginica	3(31.2)	4(136.5)	1(50.4)	-	-	3(147.7)	4(207.7)	4(172.7)
Pisidium sp.	14(-)	4(-)	2(-)	2(-)	4(183.0)	-	10(-)	2(-)
Sphaerium sp.	6(3.2	1(-)	1(-)	2(87.0)	5(2.0)	3(2.6)	1(-)	1(-)

NA = Not Available.
* Quantization not possible; denotes organism present.

POOR ORIGINAL

1565 177

Table 3.2-19

Numbers and milligrams of biomass, # (mg), of benthic organisms per Ponar grab (529 cm^2) at Station TM-AQI-11A1, August 1976. Dashes indicate species not present or no weight measurement made.

Date	3 August				17 August			
Time	0905				0900			
Air Temp. (C)	21.0				19.0			
Water Temp. (C)	21.0				19.0			
Dissolved Oxygen (ppm)	8.7				8.9			
pH	8.0				8.0			
Secchi Disc (cm)	30.5				15.2			
River Stage (ft)	4.1				4.5			
Substrate	Mud, Detritus, Some Sand				Mud, Detritus, Some Gravel, Coal			
Replicate *	A	B	C	D	A	B	C	D
Turbellaria	-	-	-	2(0.3)	15(4.5)	12(3.5)	8(2.2)	5(1.2)
Nematoda	14(0.7)	9(0.6)	12(1.0)	-	11(1.3)	9(0.8)	8(0.6)	9(0.5)
Ornatella gracilis	-	P*	-	-	-	-	-	P
Limnodrilus hoffmeisteri	122(33.8)	99(18.2)	40(13.2)	69(17.2)	138(29.7)	129(27.7)	71(9.6)	308(40.7)
Limnodrilus spp.	92(25.5)	211(38.9)	119(39.2)	147(36.7)	175(37.7)	192(41.5)	172(23.3)	351(46.4)
Peloscolex multisetosus	1(-)	-	-	-	1(-)	-	1(-)	-
Tubifex tubifex	1(-)	-	-	-	-	-	-	-
imm. tub./cap. chaetae**	-	1(-)	1(-)	1(-)	-	1(-)	-	-
Helobdella elongata	2(0.2)	1(0.6)	1(1.0)	4(2.8)	5(2.5)	-	1(0.5)	6(2.8)
Helobdella spp.	-	-	-	-	-	1(-)	-	-
Erpobdellidae	2(1.8)	1(3.8)	2(10.9)	4(48.9)	1(0.5)	2(4.0)	1(5.7)	2(12.2)
Gammarus fasciatus	-	-	1(1.0)	10(3.3)	77(6.4)	24(1.0)	8(0.6)	11(0.9)
Oecetis sp.	-	-	-	-	1(-)	-	-	-
Procladius sp.	-	3(-)	-	-	8(1.6)	10(2.0)	5(2.0)	1(-)
Chironomus decorus	1(-)	3(-)	1(-)	2(-)	-	-	1(-)	1(-)
Cryptochironomus nr. fulvus	7(-)	2(-)	3(-)	-	2(0.4)	-	3(-)	3(-)
Cryptochironomus spp. pupa	-	2(-)	-	-	-	-	-	-
Demicryptochironomus vulneratus	-	-	-	1(-)	-	-	-	-
Paracladopelma sp.	1(-)	2(-)	1(-)	2(-)	-	-	-	-
Polypedilum scalaenum	1(-)	-	-	-	-	-	-	-
Physa sp.	-	1(-)	-	-	-	-	-	-
Goniobasis virginica	2(53.9)	5(220.1)	3(130.2)	4(211.3)	5(281.5)	6(169.2)	12(455.5)	8(473.3)
Carpeloma decisa	-	-	-	-	1(-)	-	-	-
Pisidium sp.	6(-)	63(-)	8(2.4)	10(2.5)	36(9.8)	23(3.9)	16(-)	22(9.9)
Sphaerium sp.	1(0.9)	-	-	2(1.7)	3(-)	-	-	-

* Quantization not possible; denotes organism present.
** Immature tubificid with capilliform chaetae.

POOR ORIGINAL

1565 178

Table 3.2-20

Numbers and milligrams of biomass, * (mg), of benthic organisms per Ponar grab (529 cm^2) at Station TM-AQI-11A1, September 1976. Dashes indicate species not present or no weight measurement made.

Date	7 September				21 September			
Time	0850				0855			
Air Temp. (C)	15.0				17.5			
Water Temp. (C)	19.5				19.0			
Dissolved Oxygen (ppm)	9.8				8.4			
pH	7.8				8.0			
Secchi Disc (cm)	27.9				30.5			
River Stage (ft)	3.5				4.1			
Substrate	Mud, Detritus, Some Coal, Gravel				Mud, Detritus, Some Coal, Gravel			
Replicate	A	B	C	D	A	B	C	D
Turbellaria	2(0.7)	3(1.0)	11(3.5)	12(4.2)	5(2.2)	1(0.9)	1(0.7)	6(1.7)
Nematoda	5(0.5)	-	13(0.8)	1(-)	1(-)	4(-)	13(0.8)	8(0.9)
Ornatella gracilis	-	-	-	-	-	-	P*	-
Limnodrilus hoffmeisteri	58(10.4)	206(27.1)	132(23.1)	142(26.8)	145(13.8)	21(3.3)	10(1.1)	13(1.7)
Limnodrilus spp.	303(54.5)	356(46.8)	279(48.8)	371(70.1)	726(68.9)	157(24.5)	139(14.9)	306(42.6)
Peloscolex multisetosus	-	-	-	-	1(-)	-	-	-
Helobdella elongata	-	-	1(1.4)	-	-	1(2.0)	1(0.8)	4(3.1)
Helobdella sp.	-	-	-	-	-	-	2(-)	-
Erpobdellidae	1(6.0)	2(18.1)	-	-	-	1(11.4)	-	2(3.3)
Gammarus fasciatus	-	2(1.1)	1(-)	2(0.2)	-	-	2(0.2)	-
Gomphus spiniceps	-	-	-	-	-	1(-)	-	-
Procladius sp.	-	-	1(-)	-	3(-)	4(-)	2(-)	2(-)
Chironomus decorus	-	1(-)	-	-	8(0.4)	-	-	-
C. decorus pupa	-	-	1(-)	-	-	-	-	-
Cryptochironomus nr. fulvus	-	1(-)	1(-)	-	-	3(-)	2(-)	1(-)
Paracladopelma sp.	-	-	1(-)	-	-	-	-	1(-)
Polypedilum halterale	-	1(-)	1(-)	-	-	-	-	-
Physa sp.	-	-	-	-	-	1(-)	-	-
Ferrissia spp.	-	-	-	-	-	1(-)	-	-
Goniobasis virginica	-	1(4.1)	14(281.2)	-	6(193.9)	13(355.0)	15(315.5)	15(539.9)
Amnicola limosa	-	-	-	-	1(-)	-	-	1(-)
Campeloma decisa	-	-	-	-	1(-)	-	-	-
Pisidium sp.	-	20(4.4)	58(36.1)	-	22(-)	14(-)	13(-)	56(14.2)
Sphaerium sp.	-	-	4(4.4)	-	8(-)	1(-)	1(2.1)	1(-)

*Quantization not possible; denotes organism present.

POOR ORIGINAL

1565 179

Table 3.2-21

Numbers and milligrams of biomass, ' (mg), of benthic organisms per Ponar grab (529 cm^2) at Station TM-AQI-11A1, October 1976. Dashes indicate species not present or no weight measurement made.

Date	5 October				19 October			
Time	0914				0855			
Air Temp. (C)	13.0				3.0			
Water Temp. (C)	16.0				9.0			
Dissolved Oxygen (ppm)	11.0				12.4			
pH	7.9				7.6			
Secchi Disc (cm)	22.9				25.4			
River Stage (ft)	4.8				5.3			
Substrate	Mud, Sand, Detritus				Mud, Detritus, Some Sand			
Replicate	A	B	C	D	A	B	C	D
Turbellaria	34(12.4)	3(1.5)	9(5.2)	7(2.8)	2(0.6)	1(-)	1(-)	3(1.0)
Nemertinea	-	-	-	-	1(-)	1(-)	3(-)	-
Nematoda	7(0.9)	1(-)	-	5(-)	13(0.5)	4(-)	5(-)	4(-)
Plumatella repens	P*	-	-	-	-	-	-	-
Limnodrilus hoffmeisteri	11(2.1)	29(3.9)	20(2.5)	57(6.4)	17(2.6)	65(10.8)	-	-
Limnodrilus spp.	204(38.2)	329(40.1)	185(23.5)	421(46.9)	486(73.1)	906(149.9)	471(61.3)	936(130.2)
Peloscolex multisetosus	-	-	-	-	-	-	1(-)	1(-)
Helobdella elongata	1(0.7)	-	1(0.8)	-	3(1.8)	-	1(1.6)	1(0.5)
Helobdella sp.	4(-)	5(-)	1(-)	-	-	-	1(-)	-
Erpobdellidae	-	2(46.8)	-	-	1(16.7)	-	-	-
Mooreobdella microstoma	-	-	-	-	-	1(29.5)	-	-
Hydracarina	-	-	-	-	-	-	1(-)	-
Gammarus fasciatus	13(6.0)	1(0.5)	-	-	23(8.1)	20(5.5)	10(1.5)	33(10.4)
Hexagenia limbata	-	-	-	-	2(40.0)	1(17.1)	-	-
Hydropsyche phalerata	1(0.6)	-	-	-	-	-	-	-
Procladius sp.	1(-)	-	-	-	-	-	-	-
Cryptochironomus nr. fulvus	1(-)	3(-)	-	4(-)	-	3(-)	-	1(-)
Polypedilum scalaenum ipa	-	-	-	-	-	1(-)	-	-
Physa sp.	2(-)	-	-	-	-	-	-	-
Goniobasis virginica	26(552.4)	10(290.9)	7(140.8)	6(345.3)	5(208.3)	1(71.0)	3(187.2)	-
Amnicola limosa	1(-)	-	-	1(-)	-	-	-	1(-)
Pisidium sp.	7(-)	15(10.2)	20(9.2)	32(3.2)	11(-)	8(-)	6(-)	11(-)
Sphaerium sp.	-	2(-)	-	-	4(-)	1(-)	-	3(-)

* Quantization not possible; denotes organism present.

POOR ORIGINAL

1565 180

Table 3.2-22

Numbers and milligrams of biomass, " (mg), of benthic organisms per Ponar grab (529 cm^2) at Station TH-AQI-11A2, April 1975. Dashes indicate species not present or no weight measurement made.

Date	6 April				20 April			
Time	1019				1026			
Air Temp. (C)	20.0				25.0			
Water Temp. (C)	8.0				21.0			
Dissolved Oxygen (ppm)	9.9				8.6			
pH	8.4				7.6			
Secchi Disc (cm)	33.0				76.2			
River Stage (ft)	6.6				4.7			
Substrate	Mud, Detritus, Some Coal				Mud, Coal, Detritus			
Replicate	A	B	C	D	A	B	C	D
Turbellaria	-	-	-	6(2.2)	1(0.7)	-	-	-
Nemertinea	-	2(0.4)	-	3(-)	-	-	-	-
Nematoda	-	-	-	-	1(-)	-	-	-
Nais bretscheri	-	-	-	-	2(-)	-	-	-
N. variabilis	2(-)	-	-	-	-	-	-	-
Branchiura sowerbyi	-	-	-	-	-	-	1(0.8)	-
Limnodrilus claparedeianus	2(-)	-	-	3(1.4)	9(4.9)	-	-	-
L. hoffmeisteri	7(-)	42(32.5)	4(-)	11(5.3)	19(10.4)	3(-)	4(-)	19(13.7)
L. udekemianus	-	-	2(-)	4(1.9)	10(5.5)	2(-)	-	-
Limnodrilus spp.	3(-)	31(24.0)	5(-)	18(8.6)	-	4(-)	5(-)	10(7.2)
Peloscolex multisetosus	1(-)	-	-	-	-	-	-	-
Mooreobdella microstoma	-	-	-	-	-	-	-	1(-)
Gammarus fasciatus	-	-	1(5.8)	-	1(-)	-	-	1(-)
Cheumatopsyche sp.	-	-	-	1(0.6)	-	-	-	-
Chironomus decorus	-	-	-	1(-)	-	-	-	-
Phaenopsectra nr. obediens	-	-	-	-	1(-)	-	-	-
Goniobasis virginica	-	-	-	-	10(204.8)	-	1(20.9)	6(90.1)
Sphaerium sp.	-	-	-	1(-)	-	-	-	-

POOR ORIGINAL

1565 181

Table 3.2-23

Numbers and milligrams of biomass, = (mg), of benthic organisms per Ponar grab (529 cm^2) at Station TM-AQI-11A2, May 1976. Dashes indicate species not present or no weight measurement made.

Date	4 May				18 May			
Time	1040				1057			
Air Temp. (C)	NA				19.0			
Water Temp. (C)	11.8				19.8			
Dissolved Oxygen (ppm)	8.9				7.0			
pH	7.6				NA			
Secchi Disc (cm)	71.1				35.6			
River Stage (ft)	4.9				4.6			
Substrate	Mud, Detritus				Mud, Detritus			
Replicate	A	B	C	D	A	B	C	D
Turbellaria	-	1(0.4)	-	-	-	1(0.2)	-	-
Nemertinea	-	1(-)	-	-	1(-)	-	-	-
Nematoda	1(-)	-	2(-)	2(-)	1(-)	1(-)	-	-
Enchytraeidae	-	-	1(-)	-	-	-	-	-
Chaetogaster diaphanus	-	-	-	-	-	-	4(-)	-
Nais bretscheri	2(-)	5(-)	-	2(-)	-	3(-)	1(-)	-
N. elinguis	-	3(-)	2(-)	-	4(-)	3(-)	3(-)	-
N. variabilis	2(-)	4(-)	-	1(-)	1(-)	-	2(-)	-
Slavina appendiculata	-	-	-	-	-	-	1(-)	-
Branchiura sowerbyi	-	-	1(4.4)	-	-	-	-	-
Limnodrilus claparedeianus	-	-	-	-	-	-	28(5.7)	-
L. hoffmeisteri	13(1.8)	48(6.9)	33(10.1)	-	10(3.6)	65(11.9)	98(19.8)	80(25.4)
L. michaelsianus	13(1.8)	-	-	-	-	22(4.0)	42(8.5)	-
Limnodrilus spp.	99(12.5)	249(35.9)	89(27.3)	39(6.3)	113(40.1)	524(96.1)	196(39.7)	498(157.9)
Peloscolex multisetosus	-	4(1.2)	-	-	-	-	-	-
Tubifex tubifex	-	-	-	-	-	1(-)	1(-)	-
Imm. tub./cap. chaetae*	-	-	-	-	2(-)	-	1(-)	2(-)
Helobdella elongata	-	-	-	-	-	-	-	1(0.7)
Erpobdellidae	1(0.8)	-	-	-	-	-	-	-
Mooreobdella microstoma	-	-	-	-	1(19.4)	-	-	-
Gammarus fasciatus	3(-)	2(-)	1(0.1)	-	-	2(0.4)	2(0.5)	-
Procladius sp.	-	2(-)	-	-	3(-)	-	4(-)	2(-)
Criotanypus spp.	-	1(-)	-	-	-	-	-	-
Orthocladius (Orthocladius) sp.	-	-	-	1(-)	-	-	-	-
Chironomus decorus	3(-)	38(2.7)	6(-)	-	4(-)	50(40.9)	21(14.4)	58(51.2)
C. decorus puna	-	-	-	-	-	1(-)	-	1(-)
Cryptochironomus nr. fluvus	1(-)	-	-	1(-)	1(-)	-	-	-
Rheotanytarsus nr. obediens	-	-	-	-	-	-	1(-)	-
Polypedilum halterale	1(-)	-	-	-	-	-	-	-
Tanytarsus sp.	-	1(-)	-	-	2(-)	-	-	-
Corbicula virginica	4(83.7)	1(16.3)	-	-	1(53.8)	-	4(142.4)	2(28.5)
Pisidium sp.	-	3(-)	3(4.0)	1(-)	-	1(-)	-	-
Sphaerium sp.	-	-	-	-	-	-	1(-)	-

NA = Not Available

* Immature tubificid with capilliform chaetae.

POOR ORIGINAL

1565 182

Table 3.2-24

Numbers and milligrams of biomass, # (mg), of benthic organisms per Ponar grab (529 cm^2) at Station TN-AQI-11A2, June 1976. Dashes indicate species not present or no weight measurement made.

Date	1 June				15 June			
Time	0900				0835			
Air Temp. (C)	22.0				23.0			
Water Temp. (C)	19.0				23.0			
Dissolved Oxygen (ppm)	9.2				7.0			
pH	7.8				7.8			
Secchi Disc (cm)	80.4				40.6			
River Stage (ft)	5.1				4.1			
Substrate	Mud, Detritus, Some Coal, Some Gravel				Mud, Detritus, Some Coal			
Replicates	A	B	C	D	A	B	C	D
Turbellaria	-	-	-	-	1(0.6)	-	-	-
Nematoda	4(-)	-	6(-)	1(-)	-	2(-)	2(-)	1(-)
Plumatella repens	-	-	P*	-	-	-	-	-
Arcteonais lomondi	-	-	1(-)	-	-	-	-	-
Nais bretscheri	4(-)	-	5(-)	4(-)	-	-	-	-
N. elinguis	-	-	8(-)	2(-)	-	-	-	-
N. variabilis	-	-	3(-)	-	-	-	-	-
Paranais frici	-	-	3(-)	-	-	-	-	-
Slavina appendiculata	-	-	4(-)	-	-	-	-	-
Ilyodrilus templetoni	1(-)	-	1(-)	-	-	-	-	-
Limnodrilus claparedeianus	11(3.0)	-	77(18.2)	133(28.7)	12(5.5)	10(3.3)	-	19(6.0)
L. hoffmeisteri	42(11.4)	83(16.4)	115(27.2)	300(64.7)	37(17.0)	21(6.9)	64(41.7)	130(40.8)
L. udekemianus	-	-	-	-	-	-	-	18(5.6)
Limnodrilus spp.	189(51.4)	691(136.3)	269(63.6)	699(150.7)	261(120.1)	63(20.8)	52(33.9)	278(87.2)
Peloscolex ferox	-	-	-	1(-)	-	-	-	-
P. multisetosus	-	-	3(-)	-	-	2(0.3)	1(0.4)	1(0.3)
Tubifex tubifex	-	-	3(-)	-	-	-	-	-
Imm. tub./cap. chaetae**	-	3(-)	3(-)	1(-)	-	-	4(-)	-
Megadrile	-	2(-)	-	-	-	-	-	-
Helobdella elongata	-	-	-	-	-	-	-	1(0.2)
Erpobdellidae	1(0.3)	-	1(0.5)	-	3(4.6)	-	1(0.6)	2(3.7)
Gammarus fasciatus	1(-)	1(-)	1(-)	4(0.9)	5(3.2)	2(1.6)	9(3.5)	10(0.9)
Procladius sp.	-	1(-)	3(-)	3(-)	-	3(-)	2(-)	6(0.6)
Cricotopus spp.	-	-	2(-)	-	-	-	-	-
Orthocladius (Orthocladius) sp.	1(-)	-	-	-	-	-	-	-
Chironomus decorus	20(22.2)	71(35.4)	17(8.3)	9(8.5)	329(81.8)	41(13.8)	17(4.1)	72(25.3)
C. decorus pupa	1(1.3)	2(2.1)	-	1(-)	-	1(-)	-	-
Cryptochironomus nr. fulvus	-	-	1(-)	1(-)	1(-)	-	4(-)	6(2.0)
Phaenopsectra nr. obediens	-	-	1(-)	-	-	-	-	-
Polypedilum halterale	-	-	-	-	-	1(-)	-	2(0.2)
Rheotanytarsus sp.	-	-	-	-	-	-	1(-)	-
Tanytarsus sp.	-	-	2(-)	-	-	-	-	2(0.2)
Physa sp.	-	-	-	-	-	-	-	1(-)
Goniobasis virginica	1(47.0)	-	5(232.9)	-	-	5(232.5)	4(217.8)	10(400.3)
Campeloma decisa	-	-	1(-)	-	-	-	-	-
Pisidium sp.	-	1(2.1)	3(-)	1(-)	2(-)	1(-)	-	-
Sphaerium sp.	-	2(2.4)	-	1(4.5)	-	1(-)	2(-)	1(-)

* Quantization not possible; denotes organism present.
** Immature tubificid with capilliform chaetae.

POOR ORIGINAL

1565 183

Table 3.2-25

Numbers and milligrams of biomass, # (mg), of benthic organisms per Ponar grab (529 cm^2) at Station TM-AQI-11A2, July 1976. Dashes indicate species not present or no weight measurement made.

Date	6 July				20 July			
Time	0855				0850			
Air Temp. (C)	24.5				23.0			
Water Temp. (C)	24.5				24.5			
Dissolved Oxygen (ppm)	NA				7.3			
pH	8.0				8.3			
Secchi Disc (cm)	58.4				15.2			
River Stage (ft)	4.7				4.3			
Substrate	Mud, Detritus, Some Coal				Mud, Detritus, Some Gravel			
Replicate	A	B	C	D	A	B	C	D
Turbellaria	-	-	-	-	-	-	2(0.2)	-
Nematoda	1(-)	-	1(-)	-	-	-	1(-)	-
Limnodrilus claparedeianus	-	15(5.2)	-	-	-	-	20(3.7)	-
L. hoffmeisteri	68(22.1)	91(31.7)	85(18.7)	62(18.3)	118(20.2)	48(10.8)	20(3.7)	17(2.9)
L. udekemianus	-	-	-	-	20(3.4)	-	102(19.0)	34(5.7)
Limnodrilus spp.	270(87.6)	273(95.0)	556(122.2)	311(91.9)	295(50.6)	337(75.7)	345(64.2)	372(62.9)
Peloscolex multisetosus	3(4.0)	-	-	-	-	-	1(-)	-
imm. tub./cap. chaetae*	-	-	-	-	1(-)	-	-	-
Erpobdellidae	-	-	-	-	1(6.5)	1(2.3)	2(120.4)	-
Gammarus fasciatus	-	-	1(-)	-	-	-	5(0.8)	-
Procladius sp.	2(-)	1(-)	3(-)	1(-)	13(3.3)	3(2.1)	4(-)	1(-)
Chironomus decorus	24(8.6)	17(6.4)	38(16.3)	4(-)	2(0.2)	-	6(1.0)	3(-)
Cryptochironomus nr. fulvus	15(2.9)	5(2.3)	24(3.7)	2(-)	8(0.7)	-	3(-)	4(-)
Paracladopelma sp.	3(-)	-	-	-	2(0.2)	-	2(-)	-
Polypedilum halterale	-	1(-)	-	-	-	-	1(-)	5(-)
P. halterale group	-	-	-	-	-	-	1(-)	-
P. scalaenum	1(-)	-	-	-	-	-	1(-)	-
Tanytarsus sp.	-	-	-	-	-	-	1(-)	-
Conchapelopia viridinica	4(166.2)	3(93.0)	3(92.0)	-	4(75.3)	1(43.1)	6(194.3)	1(68.2)
Acricotopus lucens	-	-	-	-	-	-	1(-)	-
Pisidium sp.	2(-)	5(2.1)	4(-)	-	-	-	14(-)	1(-)
Sphaerium sp.	-	-	9(3.3)	-	1(-)	-	1(2.0)	4(2.6)

NA = Not Available.

* Immature tubificid with capilliform chaetae.

POOR ORIGINAL

1565 184

Table 3.2-26

Numbers and milligrams of biomass, # (mg), of benthic organisms per Ponar grab (529 cm^2) at Station TN-AQ1-11A2, August 1976. Dashes indicate species not present or no weight measurement made.

Date	3 August				17 August			
Time	0918				0915			
Air Temp. (C)	21.0				19.0			
Water Temp. (C)	21.0				19.0			
Dissolved Oxygen (ppm)	7.8				7.8			
pH	7.9				8.2			
Secchi Disc (cm)	30.5				15.2			
River Stage (ft)	4.1				4.5			
Substrate	Mud, Detritus				Mud, Detritus, Some Sand, Coal			
Replicate	A	B	C	D	A	B	C	D
Turbellaria	4(1.3)	3(0.8)	10(2.7)	2(0.4)	2(0.3)	-	3(0.4)	5(1.5)
Nematoda	-	-	2(-)	3(-)	2(-)	-	6(-)	2(-)
Urnatella gracilis	-	-	-	-	p*	-	-	-
Limnodrilus hoffmeisteri	70(21.4)	31(11.6)	81(20.1)	41(9.5)	58(15.9)	60(18.6)	123(33.0)	72(15.1)
L. udekemianus	10(3.1)	-	-	-	-	-	-	-
Limnodrilus spp.	141(43.1)	103(38.6)	153(38.0)	102(23.7)	59(16.1)	30(9.3)	246(66.0)	104(21.9)
Peloscolex multisetosus	-	-	2(-)	1(-)	-	-	1(-)	1(-)
imm. tub./cap. chaetae **	2(-)	-	-	-	-	-	2(-)	-
Helobdella elongata	2(2.0)	-	1(0.2)	-	4(2.4)	1(0.5)	1(0.3)	-
H. lineata	-	-	-	-	-	-	-	2(-)
Erpobdellidae	-	-	1(5.7)	-	-	1(0.4)	1(11.4)	1(2.5)
Gammarus fasciatus	2(2.1)	-	-	-	5(0.9)	5(4.0)	26(1.1)	11(3.1)
Hexagenia limbata	-	-	-	-	1(0.2)	-	-	-
Procladius sp.	-	3(0.8)	13(1.7)	2(0.4)	5(1.5)	12(2.3)	17(3.2)	11(2.4)
Coelotanypus scapularis	-	-	-	1(0.2)	-	-	-	-
Chironomus decorus	8(1.8)	7(1.1)	5(0.8)	3(0.3)	1(-)	1(-)	-	1(-)
Cryptochironomus nr. blarina	-	1(0.3)	-	-	-	-	-	-
C. nr. fulvus	12(4.5)	2(0.5)	5(-)	2(0.4)	-	-	1(-)	1(-)
Paracladopelma sp.	-	-	-	1(0.2)	-	-	-	-
Polypedilum halterale	2(0.8)	-	-	-	-	-	-	-
Physa sp.	-	-	-	-	-	1(-)	-	-
Goniobasis virginica	2(150.9)	3(156.9)	5(178.5)	1(103.8)	6(248.6)	6(342.0)	3(116.6)	11(511.3)
Amnicola limosa	-	-	1(-)	-	-	-	1(-)	-
Campeloma decisa	-	-	-	-	1(-)	-	-	-
Pisidium sp.	6(4.4)	9(-)	5(3.3)	4(-)	2(-)	1(-)	7(-)	5(-)
Sphaerium sp.	1(1.0)	2(-)	1(1.2)	1(-)	-	-	-	1(-)

* Quantization not possible; denotes organism present.

** Immature tubificid with capilliform chaetae.

POOR ORIGINAL

Table 3.2-27

Numbers and milligrams of biomass, " (mg), of benthic organisms per Ponar grab (529 cm^2) at Station [illegible]-A21-11A2, September 1976. Dashes indicate species not present or no weight measurement made.

Date	7 September				21 September			
Time	0904				0906			
Air Temp. (C)	15.0				17.0			
Water Temp. (C)	19.0				19.0			
Dissolved Oxygen (ppm)	9.0				7.6			
pH	7.9				8.1			
Secchi Disc (cm)	30.5				30.5			
River Stage (ft)	3.5				4.1			
Substrate	Mud, Detritus, Some Sand				Mud, Detritus, Some Sand, Coal			
Replicate	A	B	C	D	A	B	C	D
Turbellaria	23(9.2)	30(10.3)	7(2.0)	-	6(2.1)	-	[illegible]	-
Nemertinea	-	-	-	-	1(-)	-	-	-
Nematoda	4(-)	2(-)	-	1(-)	2(-)	-	3(-)	1(-)
Ernatella gracilis	-	-	-	-	-	P*	-	-
Limnodrilus hoffmeisteri	110(19.5)	219(32.8)	20(3.4)	176(9.7)	20(3.5)	61(10.8)	54(8.5)	41(7.9)
L. udekemianus	-	-	-	59(3.2)	10(1.8)	-	-	21(4.4)
Limnodrilus spp.	141(25.0)	379(56.9)	556(94.9)	646(35.5)	219(38.4)	173(30.7)	254([illegible])	62(12.0)
Peloscolex multisetosus	-	1(-)	-	-	6(0.4)	-	-	2(-)
Helobdella elongata	-	1(0.8)	-	-	1(0.5)	-	1(0.3)	1(1.6)
Helobdella sp.	1(-)	-	-	-	8(-)	6(-)	-	-
Placobdella rontifera	1(-)	-	-	-	-	-	-	-
Erpobdellidae	-	3(0.9)	1(30.2)	-	-	-	-	-
Gammarus fasciatus	11(7.7)	13(3.0)	-	-	52(18.2)	35(15.6)	1[illegible]	1(1.7)
Procladius sp.	7(1.4)	7(2.1)	-	-	2(0.3)	3(-)	2[illegible]	1(-)
Coelotanypus scapularis	-	-	-	-	2(0.3)	-	-	-
Chironomus decorus	1(-)	4(0.4)	-	-	1(-)	-	3(-)	-
Cryptochironomus nr. fulvus	1(-)	3(-)	11(2.9)	1(-)	3(-)	3(-)	-	-
Paracladopelma sp.	-	-	-	-	2(-)	-	1(-)	-
Polypedilum scalaenum	-	-	2(0.5)	1(-)	-	-	-	-
Physa sp.	-	-	-	-	-	3(-)	-	-
Ferrissia spp.	-	-	-	1(-)	-	1(-)	-	-
Goniobasis virginica	10(460.4)	8(257.1)	-	3(67.1)	23(301.8)	28(1660.1)	11(454.5)	5(293.4)
Amnicola limosa	1(-)	4(-)	-	-	1(-)	7(-)	1(-)	1(-)
Campeloma decisa	-	-	-	1(-)	-	2(-)	-	-
Pisidium sp.	15(-)	40(20.7)	63(7.1)	9(-)	17(-)	47(-)	5(-)	1(-)
Sphaerium sp.	4(-)	5(-)	-	-	3(-)	13(-)	-	-

* Quantization not possible; denotes organism present.

POOR ORIGINAL

1565 186

Table 3.2-28

Numbers and milligrams of biomass, # (mg), of benthic organisms per Ponar grab (529 cm^2) at Station TM-AQI-11A2, October 1976. Dashes indicate species not present or no weight measurement made.

Date	5 October				19 October			
Time	0937				0909			
Air Temp. (C)	13.5				4.0			
Water Temp. (C)	15.5				9.0			
Dissolved Oxygen (ppm)	9.4				11.8			
pH	8.0				7.6			
Secchi Disc (cm)	27.9				33.0			
River Stage (ft)	4.8				5.3			
Substrate	Mud, Detritus				Mud, Detritus			
Replicate	A	B	C	D	A	B	C	D
Turbellaria	6(2.8)	2(1.0)	4(3.0)	-	2(1.3)	5(1.6)	3(0.1)	1(1.0)
Nemertinea	-	-	2(-)	-	-	-	1(-)	1(-)
Nematoda	1(-)	1(-)	4(-)	2(-)	-	2(-)	-	2(-)
Limnodrilus hoffmeisteri	35(4.4)	30(5.6)	-	10(1.6)	-	-	-	58(7.2)
L. udekemianus	-	-	-	-	10(2.3)	32(6.9)	-	-
Limnodrilus spp.	259(32.6)	209(39.2)	228(39.6)	200(31.7)	220(49.7)	365(78.3)	422(88.2)	521(64.9)
Peloscolex multisetosus	-	1(-)	-	-	-	1(-)	-	-
Helobdella elongata	-	-	-	-	1(0.7)	-	2(0.6)	1(1.0)
Helobdella sp.	6(-)	-	2(-)	-	-	4(-)	4(-)	-
Erpobdellidae	1(20.3)	-	-	-	-	-	-	-
Gammarus fasciatus	2(1.0)	-	-	-	3(0.1)	15(10.4)	22(4.5)	6(3.7)
Hydropsyche phalerata	-	-	-	-	-	-	1(1.3)	1(0.7)
Procladius sp.	1(-)	-	-	-	-	-	-	-
Coelotanypus scapularis	-	-	-	1(-)	-	-	1(-)	-
Orthocladius (Orthocladius) sp.	-	1(-)	-	-	-	-	-	-
Chironomus decorus	-	1(-)	-	-	-	1(-)	1(-)	2(-)
Cryptochironomus nr. fulvus	4(-)	5(-)	3(-)	3(-)	-	1(-)	5(-)	2(-)
Physa sp.	-	-	-	-	-	-	1(-)	-
Ferrissia spp.	-	1(-)	-	-	-	-	-	-
Goniobasis virginica	11(498.3)	12(-)	5(197.2)	1(4.5)	3(56.3)	19(908.0)	8(386.2)	8(372.3)
Amnicola limosa	3(-)	5(-)	-	-	-	2(-)	-	1(-)
Pisidium sp.	33(-)	28(-)	12(-)	9(-)	5(-)	22(3.4)	-	15(-)
Sphaerium sp.	-	-	1(-)	-	1(-)	-	-	-

POOR ORIGINAL

Table 3.2-29

Numbers and milligrams of biomass, ' (mg), of benthic organisms per Ponar grab (529 cm^2) at Station TM-AQI-9B1, April 1976. Dashes indicate species not present or no weight measurement made.

Date	6 April				20 April			
Time	1036				1044			
Air Temp. (C)	19.5				25.0			
Water Temp. (C)	8.0				21.0			
Dissolved Oxygen (ppm)	9.7				8.2			
pH	8.4				7.4			
Secchi Di[illegible] (cm)	45.7				94.0			
River Stage (ft)	6.6				4.7			
Substrate	Mud, Detritus, Some Coal				Mud, Coal, Detritus			
Replicate	A	B	C	D	A	B	C	D
Nematoda	-	1(-)	1(-)	-	-	-	-	-
Enchytraeidae	1(-)	-	-	-	-	-	-	-
Nais variabilis	-	-	1(-)	-	-	1(-)	-	-
Limnodrilus claparedeianus	1(-)	-	-	-	-	-	-	-
L. hoffmeisteri	11(-)	10(4.4)	21(11.1)	20(15.4)	20(17.8)	39(12.2)	56(29.9)	38(17.9)
L. udekemianus	3(-)	-	-	-	10(8.9)	-	7(3.7)	-
Limnodrilus spp.	10(-)	19(8.4)	32(16.9)	39(30.1)	10(8.9)	29(9.1)	56(29.9)	10(4.7)
Peloscolex multisetosus	1(-)	-	-	-	-	-	-	1(-)
Tubifex tubifex	-	-	-	-	-	-	1(-)	-
imm. tub./cap. chaetae*	1(-)	-	-	-	-	-	1(-)	-
Optioservus sp.	-	-	-	-	-	-	-	1(-)
Procladius sp.	-	-	1(-)	-	-	-	-	-
Phaenopsectra sp.	-	-	-	-	1(-)	-	-	-
Tanytarsus sp.	-	-	-	-	-	-	1(-)	-
Goniobasis virginica	-	-	-	-	-	-	1(68.5)	-
Pisidium sp.	-	-	1(-)	-	-	-	1(-)	2(-)

* Immature tubificid with capilliform chaetae.

POOR ORIGINAL

1565 188

Table 3.2-30

Numbers and milligrams of biomass, = (mg), of benthic organisms per Ponar grab (529 cm^2) at Station TM-AQI-9B1, May 1976. Dashes indicate species not present or no weight measurement made.

Date	4 May				18 May			
Time	1102				1012			
Air Temp. (C)	9.0				19.0			
Water Temp. (C)	11.8				19.8			
Dissolved Oxygen (ppm)	8.6				6.8			
pH	7.6				NA			
Secchi Disc (cm)	71.1				35.6			
River Stage (ft)	4.9				4.6			
Substrate	Mud, Detritus				Mud, Detritus			
Replicate	A	B	C	D	A	B	C	D
Nematoda	-	-	-	-	-	-	1(-)	-
Manayunkia speciosa	-	-	-	1(-)	-	-	-	-
Chaetogaster diaphanus	1(-)	-	-	-	9(-)	-	-	-
Nais bretscheri	49(0.9)	8(0.1)	1(-)	-	2(-)	-	-	-
N. elinguis	29(0.6)	8(0.1)	1(-)	25(1.0)	1(-)	-	-	-
N. variabilis	49(0.9)	23(0.3)	2(-)	-	-	-	-	1(-)
Nais sp.	-	16(0.2)	-	-	-	1(-)	-	-
Clavina appendiculata	-	-	1(-)	-	-	-	-	-
Clyodrilus templetoni	10(3.2)	-	-	-	-	10(6.3)	-	1(-)
Limnodrilus hoffmeisteri	29(9.3)	33(16.4)	16(6.5)	46(-)	80(35.2)	64(40.0)	41(59.8)	40(29.9)
L. udekemianus	-	-	-	-	-	-	-	10(5.2)
Limnodrilus spp.	48(15.4)	33(16.4)	39(15.8)	34(-)	101(44.5)	32(20.0)	21(30.6)	61(31.9)
Peloscolex multisetosus	-	-	-	-	-	-	-	1(-)
Tubifex tubifex	10(3.2)	1(-)	8(3.2)	-	-	-	-	2(-)
Imm. tub./cap. chaetae*	19(6.1)	-	8(3.2)	1(-)	5(-)	21(13.1)	-	4(-)
Helobdella lineata	-	1(-)	-	-	-	-	-	-
Gammarus fasciatus	9(1.3)	3(-)	1(-)	1(2.7)	3(0.6)	1(0.1)	-	-
Chaoborus punctipennis	1(0.3)	-	-	-	-	-	-	-
Procladius sp.	-	-	6(0.2)	-	4(-)	7(-)	-	5(-)
Tricotopus spp.	-	2(-)	-	-	-	-	-	-
Orthocladius (Orthocladius) sp.	-	-	-	1(-)	-	-	-	-
Chironomus decorus	76(19.5)	32(9.8)	77(8.8)	33(10.3)	309(111.5)	286(194.5)	90(82.8)	325(212.1)
C. decorus pupa	-	-	-	-	5(4.2)	5(3.3)	2(-)	10(6.5)
Paratendipes sp.	3(0.2)	-	-	-	-	-	-	-
Goniobasis virginica	1(42.1)	1(46.8)	-	-	-	-	-	-
Pisidium sp.	-	-	-	1(2.1)	-	-	-	-

NA = Not Available.
* Immature tubificid with capilliform chaetae.

POOR ORIGINAL

1565 189

POOR ORIGINAL

Table 3.2-31

Numbers and milligrams of biomass, # (mg), of benthic organisms per Ponar grab (529 cm^2) at Station TM-AQI-981, June 1976. Dashes indicate species not present or no weight measurement made.

Date	1 June				15 June			
Time	0917				0852			
Air Temp. (C)	21.5				23.0			
Water Temp. (C)	19.0				23.0			
Dissolved Oxygen (ppm)	9.0				8.0			
pH	7.9				7.8			
Secchi Disc (cm)	94.0				55.9			
River Stage (ft)	5.1				4.1			
Substrate	Mud, Detritus, Coal				Mud, Detritus			
Replicate	A	B	C	D	A	B	C	D
Turbellaria	-	-	-	-	-	1(-)	-	-
Nematoda	6(-)	1(-)	1(-)	5(-)	4(-)	4(-)	3(-)	-
Enchytraeidae	-	1(-)	-	-	-	-	-	-
Arcteonais lomondi	4(-)	-	8(-)	2(-)	-	3(-)	-	-
Nais bretscheri	-	-	-	-	-	1(-)	-	-
N. elinguis	1(-)	-	-		-	-	-	-
N. variabilis	1(-)	1(-)	-	28(0.6)	-	2(-)	-	-
Paranais frici	-	1(-)	-	-	-	-	-	-
Branchiura sowerbyi	-	-	-	-	-	-	1(-)	1(-)
Ilyodrilus templetoni	-	-	-	-	-	5(0.3)	-	1(-)
Limnodrilus hoffmeisteri	20(5.9)	92(32.7)	174(40.9)	50(13.2)	588(67.0)	134(26.8)	286(39.5)	154(28.3)
Limnodrilus spp.	111(32.7)	58(20.6)	289(68.0)	99(26.1)	932(106.2)	345(68.9)	266(36.9)	201(37.6)
Peloscolex multisetosus	-	-	-	1(0.7)	1(-)	-	-	-
Tubifex tubifex	1(-)	-	1(-)	1(-)	-	5(0.3)	1(-)	3(-)
imm. tub./cap. chaetae*	6(-)	4(-)	2(-)	5(-)	2(-)	21(1.3)	5(-)	3(-)
Gammarus fasciatus	3(1.4)	2(0.9)	1(-)	4(1.0)	3(1.8)	6(2.5)	6(6.9)	2(3.5)
Cryptoleryus sp.	1(0.5)	-	-	-	1(0.4)	-	-	-
Stenelmis spp.	1(0.7)	-	1(0.5)	-	-	2(1.9)	2(2.0)	-
Procladius sp.	10(-)	4(-)	-	1(-)	45(10.9)	56(6.8)	52(5.8)	37(21.5)
Chironomus decorus	106(114.4)	84(92.5)	196(224.6)	144(140.9)	409(216.7)	326(151.2)	512(178.5)	233(116.5)
C. decorus pupa	8(6.9)	2(-)	15(14.1)	4(1.2)	2(1.3)	3(3.6)	9(8.2)	5(-)
Cryptochironomus nr. fulvus	-	-	1(-)	-	2(0.1)	-	-	-
Polypedilum halterale	-	-	-	-	5(0.2)	1(-)	-	1(-)
Tanytarsus sp.	-	-	-	-	2(0.1)	1(-)	-	-
Coniobasis virginica	1(60.4)	-	-	1(54.8)	-	2(82.2)	2(99.7)	2(85.3)
Pisidium sp.	-	-	-	-	2(-)	4(-)	1(-)	-
Sphaerium sp.	1(-)	-	-	-	4(-)	-	-	1(-)

* Immature tubificid with capilliform chaetae.

1565 190

POOR ORIGINAL

Table 3.2-32

Numbers and milligrams of biomass, * (ag), of benthic organisms per Ponar grab (529 cm^2) at station [illegible]-AQ1-451, July 1976. Dashes indicate species not present or no weight measurement made.

Date	6 July					7 July		
Time	0910					0910		
Air Temp. (C)	24.5					24.0		
Water Temp. (C)	25.[illegible]					24.5		
Dissolved Oxygen (ppm)	NA					6.4		
pH	7.0					6.3		
Secchi Disc (cm)	61.0					30.5		
River Stage (ft)	4.7					4.3		
Substrate	Mud, Detritus					Mud, Detritus		
Replicate	A	B	C	D	E	A	B	C
Turbellaria	1(-)	2(0.2)	-	-	2(1.0)	1(-)	4(0.7)	-
Nematoda	1(-)	-	1(-)	-	-	1(-)	-	1(-)
Plumatella repens	-	-	-	-	-	-	Pa*	-
Branchiura sowerbyi	-	1(10.5)	-	-	-	-	-	-
Tubificidae immature	-	1(-)	-	1(-)	-	-	-	-
Limnodrilus claparedeianus	-	-	-	-	-	15(2.7)	-	-
L. hoffmeisteri	65(17.6)	86(25.0)	90(20.2)	65(30.2)	36(6.0)	92(16.5)	34(11.6)	11(5.1)
L. udekemianus	-	-	-	-	-	-	10(3.7)	21(11.6)
Limnodrilus spp.	98(25.3)	327(95.0)	231(51.8)	207(93.4)	269(44.6)	245(43.9)	143(53.3)	85(47.1)
Peloscolex multisetosus	2(0.1)	1(-)	1(-)	1(-)	1(-)	1(-)	-	-
Imm. tub./cap. chaetae***	1(-)	7(-)	2(-)	2(-)	-	-	2(-)	-
Megadrile	-	-	-	-	-	1(-)	-	1(-)
Helobdella elongata	1(0.5)	-	-	-	-	-	1(0.2)	-
Cyrnellus fraternus	-	-	-	-	1(0.2)	-	-	-
Hexagenia limbata	-	-	-	-	1(5.8)	-	-	-
Procladius sp.	7(-)	5(-)	2(-)	5(-)	12(3.0)	14(4.7)	14(2.8)	3(-)
Chironomus decorus	5(-)	17(1.7)	8(3.5)	3(-)	33(5.5)	65(8.5)	49(5.4)	8(1.1)
Cryptochironomus nr. fulvus	2(-)	-	3(-)	-	5(0.8)	3(-)	-	-
Paraclaspelma sp.	1(-)	-	-	-	-	-	-	-
Polypedilum halterale	-	-	-	-	-	1(-)	-	-
Tanytarsus sp.	-	1(-)	-	-	-	-	-	-
Conchapelopia virginica	3(37.1)	-	-	4(231.9)	2(98.4)	2(101.8)	4(181.4)	-
Amnicola limosa	-	-	-	1(-)	-	-	-	-
Pisidium sp.	9(-)	8(-)	3(-)	4(-)	-	6(-)	1(-)	-
Sphaerium sp.	11(-)	-	1(-)	2(4.7)	-	-	1(1.9)	-

NA = Not Available
* Non-quantitative sample.
** Quantization not possible; denotes organism present.
*** Immature tubificid with capilliform chaetae.

1565 191

POOR ORIGINAL

Table 3.2-33

Numbers and milligrams of biomass, [illegible] (mg), of benthic organisms per Ponar grab (529 cm^2) at Station TM-AQI-98I, August 1976. Dashes indicate species not present or no weight measurement made.

Date	3 August				17 August			
Time	0938				0935			
Air temp. (°C)	21.0				19.0			
Water temp. (°C)	21.2				18.5			
Dissolved Oxygen (ppm)	8.4				7.7			
pH	8.0				8.0			
Secchi Disc (cm)	33.0				20.3			
River Mile (ft)	4.1				4.5			
Substrate	Mud, Detritus				Mud, Detritus, Some Coal			
Replicate	A	B	C	D	A	B	C	D
Turbellaria	-	3(0.4)	-	-	4(0.4)	-	2(0.7)	4(0.9)
Nematoda	-	-	-	-	1(-)	6(-)	1(-)	1(-)
Brachiura sowerbyi	-	-	-	-	1(-)	-	-	-
Limnodrilus hoffmeisteri	39(15.9)	29(8.0)	18(5.1)	20(7.8)	34(4.2)	45(14.8)	87(18.7)	58(6.3)
L. udekemianus	-	-	-	-	11(1.6)	-	-	-
Limnodrilus spp.	117(47.5)	79(21.9)	105(29.9)	80(31.2)	235(34.0)	84(29.2)	186(40.0)	306(33.1)
Peloscolex multisetosus	-	-	1(-)	1(-)	1(-)	1(-)	1(-)	1(-)
Imm. tub./cap. chaetae*	1(-)	-	-	-	1(-)	-	1(-)	1(-)
Nexadrile	-	-	-	-	-	1(-)	-	-
Helobdella lineata	-	-	-	-	-	-	-	1(-)
Lumbriculus variegatus	-	1(1.1)	-	-	-	-	-	1(0.3)
Chaetogaster cumberlandensis	-	-	-	-	-	1(-)	-	-
Erpobdella sp.	5(-)	14(4.2)	13(3.7)	10(1.9)	14(2.2)	27(5.3)	15(3.3)	13(4.1)
Chironomus decorus	37(14.7)	19(6.3)	27(14.9)	19(6.8)	29(6.5)	8(3.9)	14(3.3)	21(5.5)
C. decorus pupa	-	1(-)	-	-	-	-	-	-
Cryptochironomus nr. fulvus	8(2.4)	6(3.0)	4(4.0)	4(-)	5(-)	1(-)	3(-)	4(3.2)
Cryptochironomus spp. pupa	-	-	-	-	1(-)	-	-	-
Polypedilum halterale	2(-)	-	-	-	2(-)	-	-	2(-)
Paltenia group sp.	-	-	-	-	1(-)	-	-	-
Unionicola virginica	3(185.0)	7(322.4)	3(131.8)	4(252.6)	2(112.1)	3(173.8)	2(145.3)	5(355.8)
Valvata tricarinata	-	-	-	-	-	-	-	1(-)
Amnicola limosa	-	5(-)	-	-	-	-	-	1(-)
Pisidium sp.	11(-)	8(-)	4(-)	11(-)	21(-)	14(-)	4(-)	15(-)
Sphaerium sp.	-	28(-)	29(-)	4(-)	6(-)	1(-)	1(-)	-

* Immature tubificid with capilliform chaetae.

1565 192

POOR ORIGINAL

Table 3.2-34

Numbers and milligrams of biomass, - (mg), of benthic organisms per Ponar grab (529 cm^2) at station [illegible], September 1976. Dashes indicate species not present or no weight measurement made.

Date	7 September				21 September			
Time	0925				0925			
Air Temp. (C)	15.5				19.5			
Water Temp. (C)	19.0				19.5			
Dissolved Oxygen (ppm)	8.6				7.9			
pH	7.9				8.1			
Secchi Disc (cm)	43.2				30.5			
River Stage (ft)	3.5				4.1			
Substrate	Mud, Detritus				Mud, Detritus			
Replicate	A	B	C	D	A	B	C	D
Turbellaria	8(1.9)	4(0.8)	9(3.0)	1(-)	-	7(3.0)*	6(3.3)	1(-)
Nematoda	-	-	-	-	-	-	1(-)	-
Limnodrilus gracilis	-	-	-	-	-	-	P*	-
Limnodrilus templetoni	-	-	-	-	-	2(-)	13(1.8)	-
Limnodrilus hoffmeisteri	89(16.5)	99(18.1)	36(9.1)	21(6.9)	172(33.2)	104(22.6)	103(25.7)	161(35.1)
L. claparedianus	-	-	-	-	-	15(3.3)	-	-
Limnodrilus spp.	155(28.7)	315(57.6)	192(48.7)	150(49.1)	122(23.6)	254(55.2)	290(45.7)	354(78.2)
Peloscolex multisetosus	-	-	-	1(-)	-	1(-)	5(-)	3(-)
Imm. tub./cap. chaetae**	1(-)	-	4(-)	1(-)	-	5(-)	3(0.4)	1(-)
Helobdella elongata	-	1(1.2)	-	-	-	-	-	-
Helobdella sp.	-	-	-	1(-)	-	-	-	-
Carrarma fasciatus	-	-	-	-	-	-	1(0.7)	-
Caecidotea kenki	1(6.5)	-	-	-	-	-	-	1(6.1)
Caecidotea sp.	-	-	1(-)	-	-	-	-	-
Procladius sp.	6(0.4)	2(-)	3(2.1)	12(2.4)	-	3(-)	2(-)	3(0.4)
Coelotanypus scapularis	-	1(-)	-	-	-	-	-	-
Ablabesmyia sp.	2(0.1)	-	-	-	-	-	-	2(0.3)
Chironomus decorus	3(2.7)	-	2(1.4)	-	-	27(2.1)	70(6.5)	12(3.4)
Cryptochironomus nr. fulvus	-	-	3(2.1)	6(5.0)	-	4(-)	3(-)	6(0.8)
Polypedilum halterale	9(0.4)	-	-	-	1(-)	-	-	-
P. scalaenum pupa	-	-	-	-	-	1(-)	-	-
Cyrnellus parvus	-	-	-	-	1(-)	-	1(-)	-
Corbicula virginica	3(148.7)	7(324.4)	2(100.3)	2(101.8)	2(108.0)	3(185.6)	7(350.1)	6(267.5)
Valvata tricarinata	1(-)	1(-)	1(-)	-	-	-	-	2(-)
Amnicola limosa	1(-)	-	3(-)	1(-)	-	1(-)	-	2(-)
Pisidium sp.	2(-)	15(12.0)	6(1.0)	20(-)	4(-)	16(-)	17(-)	18(-)
Sphaerium sp.	1(5.8)	-	-	10(-)	2(-)	8(-)	4(-)	-

* Quantization not possible; denotes organism present.

** Immature tubificid with capilliform chaetae.

1565 193

POOR ORIGINAL

Table 3.2-35

Numbers and milligrams of biomass, wet wgt, of benthic organisms per Ponar grab (529 cm^2) at station TM-AQI-931, October 1/5. Dashes indicate species not present or no weight measurement made.

Date	5 October				19 October			
Time	1700				0925			
Air temp. (°C)	13.5				4.0			
Water temp. (°C)	15.5				9.0			
Dissolved oxygen (ppm)	-				11.6			
pH	8.1				7.4			
Secchi disc (cm)	27.9				35.6			
River stage (ft)	4.8				5.3			
Substrate	Mud, Detritus				Mud, Detritus			
Replicate	A	B	C	D	A	B	C	D
Turbellaria	3(2.5)	3(2.5)	5(4.3)	2(1.4)	-	1(0.3)	-	-
Nematoda	-	-	2(+)	-	1(+)	2(0.6)	-	1(+)
Branchiura sowerbyi	-	-	-	-	-	1(+)	-	-
Limnodrilus templetoni	6(0.7)	1(+)	2(+)	-	-	-	-	1(+)
Limnodrilus hoffmeisteri	135(26.3)	54(28.3)	116(30.4)	56(12.2)	45(13.0)	* -	50(17.8)	70(26.4)
L. udekemianus	-	1(+)	-	-	1(+)	21(7.7)	-	35(13.4)
Limnodrilus spp.	422(86.1)	503(112.0)	367(96.2)	389(+5.0)	313(90.1)	233(85.6)	149(53.1)	314(120.5)
Peloscolex multisetosus	4(+)	3(1.2)	-	-	-	1(+)	-	7(1.2)
Imm. tub./cap. chaetae*	18(2.0)	+(+)	3(+)	1(+)	-	-	1(+)	2(+)
Helobdella elongata	-	1(1.9)	-	-	-	-	-	1(0.3)
Glossiphonia lineata	-	-	-	-	-	1(+)	-	-
Nephelopsis obscura	-	1(4.9)	-	1(+.6)	-	1(11.3)	1(0.6)	2(34.4)
Haemopis sp.	-	-	-	-	-	1(0.4)	-	1(+)
Promesostoma sp.	3(2.7)	2(+)	4(+)	2(+)	-	1(+)	-	-
Ablabesmyia sp.	-	1(+)	-	-	-	-	-	-
Orthocladiinae	-	-	-	-	-	-	-	1(+)
Chironomus decorus	47(13.4)	11(2.6)	18(3.5)	22(6.1)	-	1(+)	-	2(+)
Tanytarsini/Chironomus nr. fulvus	4(0.8)	13(2.2)	2(+)	10(1.5)	-	1(+)	1(+)	2(+)
Pisidium lacus virginica	3(154.5)	3(152.5)	3(241.2)	3(261.7)	1(46.0)	-	-	-
Sphaerium fabale	3(+)	1(+)	2(+)	-	-	-	-	-
Pisidium sp.	7(3.4)	15(+)	12(+)	15(3.0)	-	-	6(+)	3(+)
Sphaerium sp.	8(+)	+(+)	-	-	-	22(+)	6(+)	-

* Immature tubificid with capilliform chaetae.

1565 194

POOR ORIGINAL

Table 3.2-[illegible]

Numbers and percent composition of benthic organisms collected at the macroinvertebrate stations, [illegible] through October 1976. Dashes indicate species not present.

	[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Turbellaria	6	[illegible]	2	0.01	155	0.70	133	[illegible]	[illegible]	[illegible]	376	[illegible]
Nemertinea	38	0.28	3	0.02	14	0.06	12	[illegible]	-	-	67	[illegible]
Nematoda	143	1.05	88	0.65	311	1.40	87	[illegible]	[illegible]	[illegible]	667	[illegible]
Manayunkia speciosa	1	[illegible]	-	-	[illegible]	-	-	-	1	[illegible]	2	[illegible]
Enchytraeidae	3	[illegible]	-	-	-	-	1	[illegible]	2	[illegible]	6	[illegible]
Arcteonais lomondi	[illegible]	[illegible]	1	0.01	1	[illegible]	1	[illegible]	17	[illegible]	42	[illegible]
Aulophorus furcatus	1	[illegible]	1	0.01	-	-	-	-	-	-	2	[illegible]
Chaetogaster diaphanus	[illegible]	[illegible]	[illegible]	[illegible]	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	248	[illegible]
Nais bretscheri	32	[illegible]	[illegible]	[illegible]	34	0.15	[illegible]	[illegible]	41	[illegible]	165	[illegible]
N. elinguis	1435	[illegible]	[illegible]	1.41	37	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
N. variabilis	132	[illegible]	[illegible]	[illegible]	2	0.01	15	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Nais sp.	-	-	-	[illegible]	-	-	-	-	-	-	[illegible]	[illegible]
Ophidonais serpentina	30	0.22	13	[illegible]	-	-	-	-	-	-	43	[illegible]
Paranais frici	44	0.53	3	[illegible]	2	0.01	1	[illegible]	1	[illegible]	[illegible]	[illegible]
Piguetiella michiganensis	-	-	12	[illegible]	3	0.01	[illegible]	[illegible]	1	[illegible]	[illegible]	[illegible]
Aulodrilus pluriseta	-	-	1	[illegible]	-	-	-	-	-	-	1	[illegible]
Branchiura sowerbyi	35	[illegible]	3	[illegible]	-	-	[illegible]	[illegible]	[illegible]	[illegible]	45	[illegible]
Ilyodrilus templetoni	48	[illegible]	32	[illegible]	-	-	[illegible]	[illegible]	[illegible]	[illegible]	252	0.25
Limnodrilus cervix	-	-	22	0.13	-	-	-	-	-	-	[illegible]	[illegible]
L. claparedeianus	533	3.91	133	[illegible]	38	0.17	114	[illegible]	16	[illegible]	[illegible]	1.17
L. hoffmeisteri	4455	47.42	4417	45.04	14152	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	65516	72.16
L. udekemianus	162	[illegible]	120	0.74	65	0.29	[illegible]	[illegible]	[illegible]	[illegible]	412	[illegible]
Peloscolex ferox	-	-	-	-	-	-	1	[illegible]	-	-	1	[illegible]
P. multisetosus	23	0.17	38	0.25	33	0.15	12	[illegible]	[illegible]	[illegible]	154	0.14
Tubifex tubifex	374	2.76	147	[illegible]	33	0.11	21	[illegible]	[illegible]	[illegible]	214	0.24
Lumbriculidae	2	[illegible]	-	-	-	-	-	-	-	-	2	0.00
Stylodrilus heringianus	2	[illegible]	-	-	-	-	-	-	-	-	2	[illegible]
Megadrile	5	[illegible]	2	0.01	-	-	2	[illegible]	1	[illegible]	12	[illegible]
Helobdella elongata	-	-	2	0.01	123	0.55	14	[illegible]	5	[illegible]	144	0.16
H. [illegible]	1	0.01	-	-	1	0.00	2	[illegible]	2	[illegible]	6	0.01
Helobdella sp.	1	[illegible]	2	0.01	16	0.07	31	[illegible]	1	[illegible]	51	0.05
Placobdella montifera	-	-	-	-	-	-	1	[illegible]	-	-	1	[illegible]
Erpobdellidae	-	-	-	-	105	0.47	22	[illegible]	-	-	127	0.14
Mooreobdella microstoma	-	-	-	-	6	0.03	2	[illegible]	-	-	8	[illegible]
Hydracarina	4	[illegible]	-	-	1	0.00	-	-	-	-	5	0.01
Asellus [illegible]	1	[illegible]	-	-	-	-	-	-	-	-	1	0.00
Crangonyx sp.	1	0.01	-	-	-	-	-	-	-	-	1	0.00
Gammarus fasciatus	47	[illegible]	59	[illegible]	626	2.82	262	[illegible]	[illegible]	0.25	1084	1.20
[illegible] spp.	-	-	1	0.01	-	-	-	-	-	-	1	0.00
Collembola	-	-	1	0.01	-	-	-	-	-	-	1	0.00
Hexagenia limbata	4	[illegible]	6	0.04	4	0.02	1	[illegible]	[illegible]	[illegible]	24	0.03
Hexagenia spp.	2	[illegible]	-	-	-	-	-	-	-	-	2	0.00
Caenis sp.	1	[illegible]	-	-	-	-	-	-	-	-	1	0.00
Ephemerella serrata group sp.	1	[illegible]	-	-	-	-	-	-	-	-	1	0.00
Gomphus spiniceps	1	[illegible]	1	0.01	3	0.01	-	-	-	-	5	0.01
Macromia illinoiensis	1	[illegible]	-	-	-	-	-	-	-	-	1	[illegible]
Corixidae	-	-	1	0.01	-	-	-	-	-	-	1	[illegible]
Cheumatopsyche sp.	14	[illegible]	1	[illegible]	-	-	1	[illegible]	2	[illegible]	18	0.02
Hydropsyche bifida group sp.	2	[illegible]	-	-	-	-	-	-	-	-	2	[illegible]
H. phalerata	6	[illegible]	3	0.02	1	0.00	2	[illegible]	-	-	12	0.01
Hydropsyche sp.	-	-	1	0.01	-	-	-	-	-	-	1	[illegible]
Protoptila sp.	1	0.01	-	-	-	-	-	-	-	-	1	[illegible]
Ceraclea tarsipunctata	-	-	-	-	1	0.00	-	-	-	-	1	0.00
Oecetis sp.	2	[illegible]	-	-	2	[illegible]	-	-	1	[illegible]	5	0.01
[illegible] spp.	2	[illegible]	2	0.01	-	-	-	-	-	-	4	0.00
[illegible] sp.	1	[illegible]	1	0.01	-	-	-	-	3	0.02	5	0.01
[illegible] sp.	1	[illegible]	1	0.01	-	-	-	-	-	-	2	[illegible]
Stenelmis decorata	2	[illegible]	-	-	-	-	-	-	-	-	2	[illegible]
Stenelmis spp.	1	[illegible]	7	0.05	10	0.04	-	-	6	[illegible]	24	0.03
Psychoda sp.	1	[illegible]	-	-	1	0.00	-	-	-	-	2	[illegible]
Telmatoscopus sp.	-	-	-	-	1	0.00	-	-	-	-	1	0.00
Chaoborus punctipennis	-	-	1	0.01	-	-	-	-	2	[illegible]	3	0.00
Procladius sp.	60	[illegible]	476	3.12	69	0.31	145	[illegible]	[illegible]	2.25	1199	1.32
Psectrotanypus sp.	1	[illegible]	3	0.02	-	-	-	-	-	-	4	0.00
Coelotanypus scapularis	-	-	-	-	-	-	5	[illegible]	1	0.01	6	0.01
Ablabesmyia cf. *philosphagnos*	-	-	-	-	1	0.00	-	-	-	-	1	0.00
Ablabesmyia sp.	5	[illegible]	7	0.05	-	-	-	-	5	0.03	17	0.02
Diamesa sp.	2	[illegible]	-	-	-	-	-	-	-	-	2	0.00
Orthocladiinae	-	-	-	-	-	-	-	-	1	0.01	1	0.00
Cricotopus sylvestris group sp.	2	[illegible]	-	-	-	-	-	-	-	-	2	0.00
Cricotopus spp.	41	0.30	4	0.03	[illegible]	0.01	3	0.02	2	0.02	51	0.06
[illegible] sp. A	3	[illegible]	-	-	-	-	-	-	-	-	3	0.00
Orthocladius (*Euorthocladius*) sp.	3	[illegible]	-	-	-	-	-	-	-	-	3	0.00
Orthocladius (*Orthocladius*) sp.	55	[illegible]	5	0.04	6	0.03	3	[illegible]	1	0.01	70	0.08
Parametriocnemus sp.	[illegible]	[illegible]	-	-	-	-	-	-	-	-	1	0.00
Psectrocladius sp.	9	[illegible]	6	0.04	3	0.01	-	-	-	-	18	0.02
Chironomus [illegible]	1028	[illegible]	[illegible]	20.07	213	0.96	896	[illegible]	[illegible]	19.50	[illegible]	[illegible]
Cryptochironomus cf. *blarina*	13	[illegible]	-	-	2	0.01	1	[illegible]	-	-	16	[illegible]
C. cf. *fulvus*	222	[illegible]	14	0.09	126	0.57	145	[illegible]	111	0.56	618	0.68
Demicryptochironomus vulneratus	1	[illegible]	-	-	1	0.00	-	-	-	-	2	0.00
Dicrotendipes modestus	11	[illegible]	1	0.01	-	-	-	-	-	-	12	0.01
Dicrotendipes sp.	2	[illegible]	-	-	-	-	-	-	-	-	2	0.00
Glyptotendipes sp.	[illegible]	[illegible]	-	-	1	0.00	-	-	-	-	2	0.00
Harnischia cf. *amachaerus*	1	0.01	-	-	-	-	-	-	-	-	2	0.00

1565 195

POOR ORIGINAL

Table [illegible] continued.

	TM-AQI-[illegible] N	%	TM-AQI-IA[illegible] N	%	TM-AQI-II[illegible] N	%	TM-AQI-IIA[illegible] N	%	TM-AQI-[illegible] N	%	Total N	%
[illegible] sp.	-	-	-	-	1	[illegible]	-	-	-	-	1	[illegible]
[illegible] sp.	46	[illegible]	7	0.05	14	[illegible]	11	[illegible]	1	0.01	[illegible]	[illegible]
[illegible] sp.	-	-	-	-	-	-	-	-	3	[illegible]	3	[illegible]
[illegible] or [illegible]	78	[illegible]	21	0.14	56	[illegible]	3	[illegible]	1	[illegible]	157	0.17
[illegible] group sp.	[illegible]	[illegible]	-	-	-	-	-	-	-	-	2	[illegible]
P. [illegible]	-	-	2	[illegible]	17	[illegible]	14	[illegible]	24	0.12	57	0.06
[illegible] or [illegible]	18	[illegible]	4	[illegible]	3	[illegible]	-	-	-	-	25	[illegible]
P. [illegible]	220	[illegible]	-	-	7	[illegible]	5	[illegible]	1	0.01	223	0.25
[illegible] sp.	5	[illegible]	-	-	-	-	-	-	-	-	5	[illegible]
[illegible]	2	[illegible]	-	-	-	-	-	-	-	-	2	[illegible]
[illegible] sp.	4	[illegible]	-	-	1	[illegible]	1	[illegible]	-	-	4	[illegible]
[illegible] spp.	14	[illegible]	-	-	4	0.11	-	-	1	[illegible]	53	[illegible]
[illegible] sp.	2	[illegible]	4	[illegible]	-	-	-	-	1	0.01	7	[illegible]
[illegible] sp.	1	[illegible]	-	-	1	[illegible]	-	-	-	-	2	[illegible]
[illegible]	1	[illegible]	-	-	1	[illegible]	-	-	-	-	2	[illegible]
[illegible] sp.	1	[illegible]	-	-	-	-	-	-	-	-	1	[illegible]
[illegible] sp.	4	[illegible]	3	0.02	5	[illegible]	[illegible]	[illegible]	-	-	54	0.06
[illegible] sp.	9	[illegible]	-	-	-	-	-	-	-	-	9	0.01
[illegible]	14	[illegible]	-	-	-	-	-	-	-	-	21	0.02
[illegible] spp.	[illegible]	[illegible]	208	1.37	1	[illegible]	1	[illegible]	1	[illegible]	[illegible]	0.91
[illegible]	117	[illegible]	144	[illegible]	245	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	1	[illegible]	-	-	-	-	-	-	-	-	1	[illegible]
[illegible]	-	-	-	-	-	-	-	-	-	[illegible]	6	[illegible]
[illegible]	-	-	-	-	7	[illegible]	[illegible]	[illegible]	[illegible]	0.11	57	[illegible]
[illegible] immature	1	[illegible]	-	-	2	[illegible]	[illegible]	[illegible]	-	-	[illegible]	0.01
[illegible] sp.	449	[illegible]	26	0.17	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1	[illegible]
[illegible] sp.	354	[illegible]	25	0.16	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
											714	[illegible]
Total	[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]	

Table [illegible]-37

Estimates of density (number m[illegible]) of the dominant taxa ([illegible]% of the total specimens) at the macroinvertebrate stations, April through October 19[illegible]. Dashes indicate species not present.

	Apr	May	Jun	Jul	Aug	Sep	Oct
TM-AQI-IA1							
Nais elinguis	14	4412	43	-	-	-	-
Limnodrilus claparedeianus	61	47	475	[illegible]	[illegible]	44	62
L. hoffmeisteri	503	2667	3207	[illegible]	[illegible]	[illegible]	2396
L. udekemianus	2	33	24	24	125	-	128
[illegible] fasciatus	-	40	54	24	21	50	16
[illegible] sp.	2	21	19	24	54	7	5
Chironomus decorus	5	35	858	[illegible]	14	476	763
Pisidium sp.	144	33	45	54	73	333	[illegible]
TM-AQI-IA2							
Nais elinguis	33	[illegible]	4	-	-	-	-
Limnodrilus claparedeianus	7	-	188	45	-	71	26
L. hoffmeisteri	330	[illegible]	2736	3991	3412	7330	4223
L. udekemianus	44	-	-	-	-	73	111
[illegible] fasciatus	14	7	2	-	-	-	111
[illegible] sp.	-	111	163	274	347	244	39
Chironomus decorus	-	333	2786	1439	1744	754	121
Pisidium sp.	2	5	2	7	5	14	26
TM-AQI-IIA1							
Nais elinguis	-	44	19	-	-	-	-
Limnodrilus claparedeianus	49	-	31	-	-	-	-
L. hoffmeisteri	491	8032	8617	4810	5758	7464	9776
L. udekemianus	12	90		12	-	-	-
[illegible] fasciatus	-	158	721	38	310	17	236
[illegible] sp.	-	57	40	17	96	28	2
Chironomus decorus	-	156	255	35	21	26	-
Pisidium sp.	2	7	24	40	[illegible]	432	260
TM-AQI-IIA2							
Nais elinguis	-	35	24	-	-	-	-
Limnodrilus claparedeianus	33	66	619	83	-	-	-
L. hoffmeisteri	437	[illegible]	7784	7722	3483	7469	6042
L. udekemianus	43	182	43	344	24	213	99
[illegible] fasciatus	7	24	78	14	116	267	113
[illegible] sp.	-	26	43	50	149	57	2
Chironomus decorus	2	425	1373	222	61	21	12
Pisidium sp.	-	19	19	61	92	466	293
TM-AQI-IIB1							
Nais elinguis	-	158	2	-	-	-	-
Limnodrilus claparedeianus	2	-	-	35	-	-	-
L. hoffmeisteri	992	1447	7722	5000	[illegible]	6337	7481
L. udekemianus	47	24	-	73	26	35	206
[illegible] fasciatus	-	43	66	2	5	2	2
[illegible] sp.	2	52	484	158	262	73	28
Chironomus decorus	-	2454	4863	[illegible]	414	64	239
Pisidium sp.	9	2	17	73	215	232	14

Table 3.2-38

Estimates of biomass (mg/m²) of the dominant taxa by weight at the macroinvertebrate stations, April through October 1976. Dashes indicate species not present. * indicates organism present but weight not determined.

	Apr	May	Jun	Jul	Aug	Sep	Oct
TM-AQI-1A1							
Limnodrilus hoffmeisteri	207.0	661.5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Chironomus [illegible]	*	*	[illegible]	[illegible]	*	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
TM-AQI-1A2							
Limnodrilus hoffmeisteri	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Chironomus [illegible]	*	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
TM-AQI-11A1							
Limnodrilus hoffmeisteri	233.7	[illegible]	[illegible]	[illegible]	1132.6	1125.7	1147.7
[illegible]	*	56.2	[illegible]	[illegible]	*	1.0	*
[illegible]	1126.4	895.6	[illegible]	1905.0	4714.1	[illegible]	4243.6
TM-AQI-11A2							
Limnodrilus hoffmeisteri	240.3	1170.6	[illegible]	1434.6	[illegible]	[illegible]	1029.2
Chironomus [illegible]	*	258.0	[illegible]	76.8	[illegible]	[illegible]	*
[illegible]	746.2	767.2	[illegible]	1730.0	[illegible]	[illegible]	[illegible]
TM-AQI-981							
Limnodrilus hoffmeisteri	512.1	857.0	[illegible]	1319.4	[illegible]	[illegible]	[illegible]
Chironomus [illegible]	*	1775.3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	161.4	210.1	[illegible]	1537.3	[illegible]	[illegible]	[illegible]

Table 3.2-39

Diversity (D) values at the macroinvertebrate stations, April through October 1976.

Station Number	Apr	May	Jun	Jul	Aug	Sep	Oct
TM-AQI-1A1	2.75	2.24	2.47	1.83	2.06	2.40	2.66
TM-AQI-1A2	2.66	2.75	1.76	1.37	1.53	0.42	1.32
TM-AQI-11A1	1.78	0.69	1.41	1.20	1.31	0.79	0.73
TM-AQI-11A2	1.78	1.11	1.37	0.93	1.34	1.30	[illegible]
TM-AQI-981	0.66	1.48	1.49	1.13	1.66	1.08	[illegible]

POOR ORIGINAL

Table 3.2-40

Indices of percent similarity of species composition (PSc) between the macroinvertebrate stations sampled April through October 1974, 1975, and 1976. Prefix TM-AQI- deleted for table.

1974			85	1A2	68			1975
		79	77	11A1	64	87		
	84	88	83	11A2	65	93	93	
87	74	86	82	981	64	94	85	90
11A2	11A1	1A2	1A1		1A1	1A2	11A1	11A2
77	76	91	81	981				
	89	75	60	11A2				
		70	57	11A1				
1976			64	1A2				

1565 197

POOR ORIGINAL

Table 3.2-41

Analysis of variance, randomized block design for number of taxa, April through October 1976.

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Total	69	2241.48906		
Station	4	614.91036	153.72759	10.74?16*
Date	13	885.87160	68.14?92	4.7??92*
Error	52	740.70706	14.24436	

* Significant at 0.05.

Table 3.2-42

Comparison of mean number of taxa at the macroinvertebrate stations using Student-Newman-Keuls multirange test, April through October 1976. Mean number of taxa underscored are not significantly different (p = 0.05).

Station	IA2	?A1	IIA2	IIA1	IA1
Mean No. of Taxa	14	17	19	20	23

(Underscored: 14–17; 17–20)

Table 3.2-43

Comparison of mean number of taxa by sampling date (April through October 1976) using Student-Newman-Keuls multirange test.

	[illegible]	[illegible]	[illegible]	[illegible]	17 Aug	3 Aug	20 Jul	6 Jul	15 Jun	1 Jun	18 May	4 May	20 Apr
6 Apr	-*	-	x**	-	-	-	-	-	x	x	x	x	-
20 Apr	-	-	-	-	-	-	-	-	x	x	-	x	
4 May	-	-	-	-	-	-	-	-	-	x	-		
18 May	-	-	-	-	-	-	-	-	-	-			
1 Jun	x	x	-	x	x	x	x	x	-				
15 Jun	-	-	-	-	-	-	-	-					
6 Jul	-	-	-	-	-	-	-						
20 Jul	-	-	-	-	-	-							
3 Aug	-	-	-	-	-								
17 Aug	-	-	-	-									
7 Sep	-	-	-										
21 Sep	-	-											
5 Oct	-												

* Dash indicates not significant.
** Significant at 0.05.

POOR ORIGINAL

Table 3.2-44

Three-factor analysis of variance for densities of Limnodrilus hoffmeisteri at the macroinvertebrate stations, May through October 1974 through 1976.

Source	DF	SS	MS	F
Total	719	262.70432		
Year	2	24.55151	12.27576	142.**
Date	11	13.46256	1.24205	14.3**
Station	4	63.52844	15.88211	184.4**
Year x Date	22	31.77747	1.44443	16.7**
Year x Station	8	26.19605	3.27451	37.9**
Date x Station	44	17.37276	0.39484	4.57**
Year x Date x Station	88	44.81187	0.50923	5.9**
Error	540	46.91209	0.08687	

* Significant at 0.05.

Table 3.2-45

Comparison of logarithmic mean density of Limnodrilus hoffmeisteri by year (May through October 1974-1976) using Student-Newman-Keuls multirange test ($\alpha = 0.05$).

Year	1974	1975	1976
Logarithmic Mean Density	3.12419	3.35385	3.57944

Table 3.2-46

Comparison of logarithmic mean density of Limnodrilus hoffmeisteri by sampling date (May through October 1974-1976) using Student-Newman-Keuls multirange test.

	I May*	I 15	II 2	I 29	II Aug	I Aug	II Jul	I Jul	II Jun	I Jun	II May
I May	-**	-	x***	x	x	-	x	x	x	x	-
II May	x	x	x	x	-	-	x	x	x	x	
I Jun	x	x	-	-	x	x	-	-	-		
II Jun	x	x	-	-	-	x	-	-			
I Jul	x	x	-	-	-	x	-				
II Jul	x	x	-	-	x	x					
I Aug	x	x	x	x	-						
II Aug	x	x	-	-							
I Sep	x	x	-								
II Sep	x	x									
I Oct	-										

* Signifies first (I) or second (II) sampling date.
** Dash indicates not significant.
*** Significant at 0.05.

Table 3.2-47

Comparison of logarithmic mean density of Limnodrilus hoffmeisteri at the macroinvertebrate stations using Student-Newman-Keuls multirange test, May through October 1974-1976. Mean densities underscored are not significantly different ($\alpha = 0.05$).

Station	1A1	1A2	9B1	11A2	11A1
Logarithmic Mean Density	2.86672	3.36002	3.42609	3.59059	3.63254

1565 199

POOR ORIGINAL

1565 200

POOR ORIGINAL

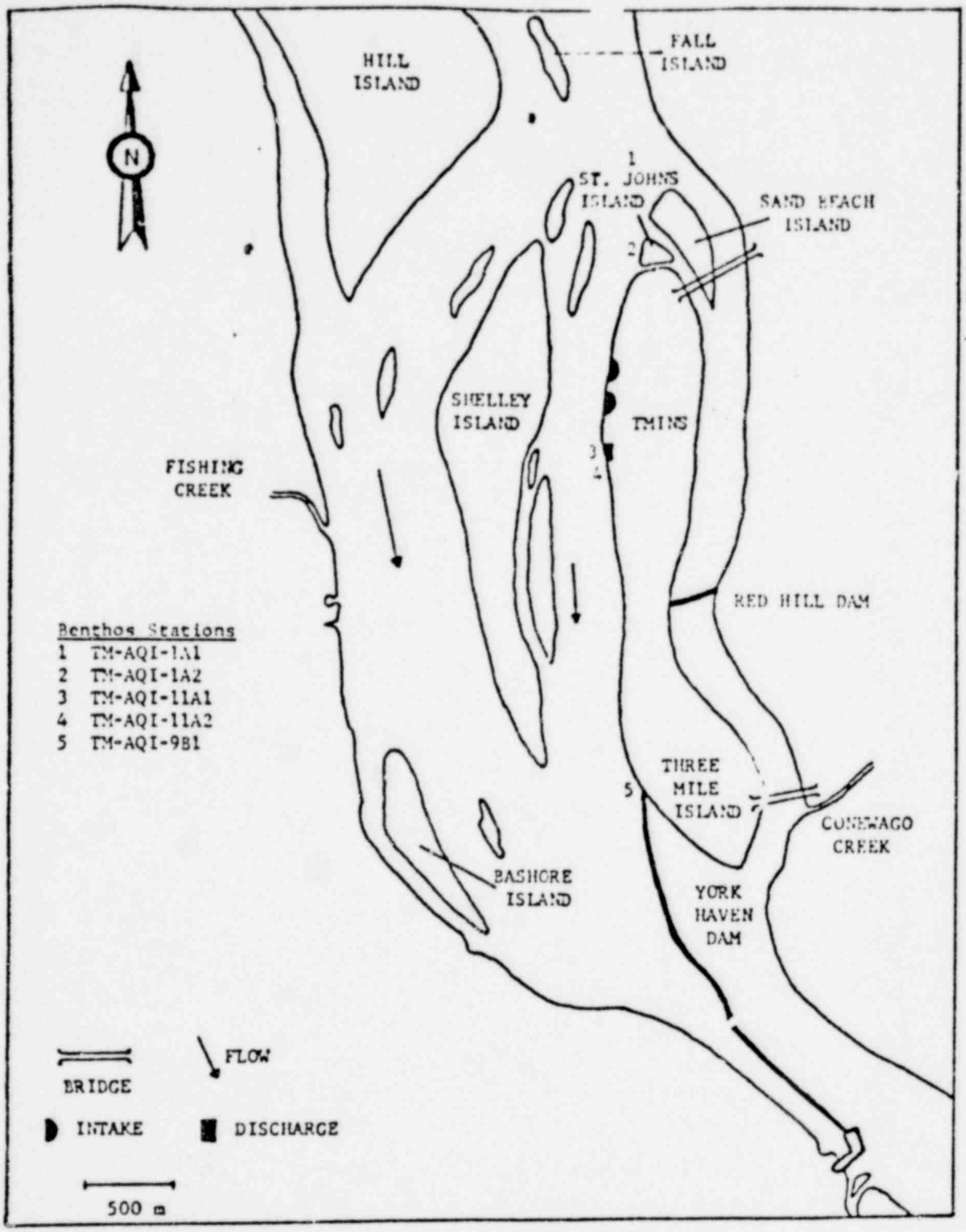

Figure 3.1-1. Location of benthic macroinvertebrate stations in the vicinity of TMINS.

1565 201

POOR ORIGINAL

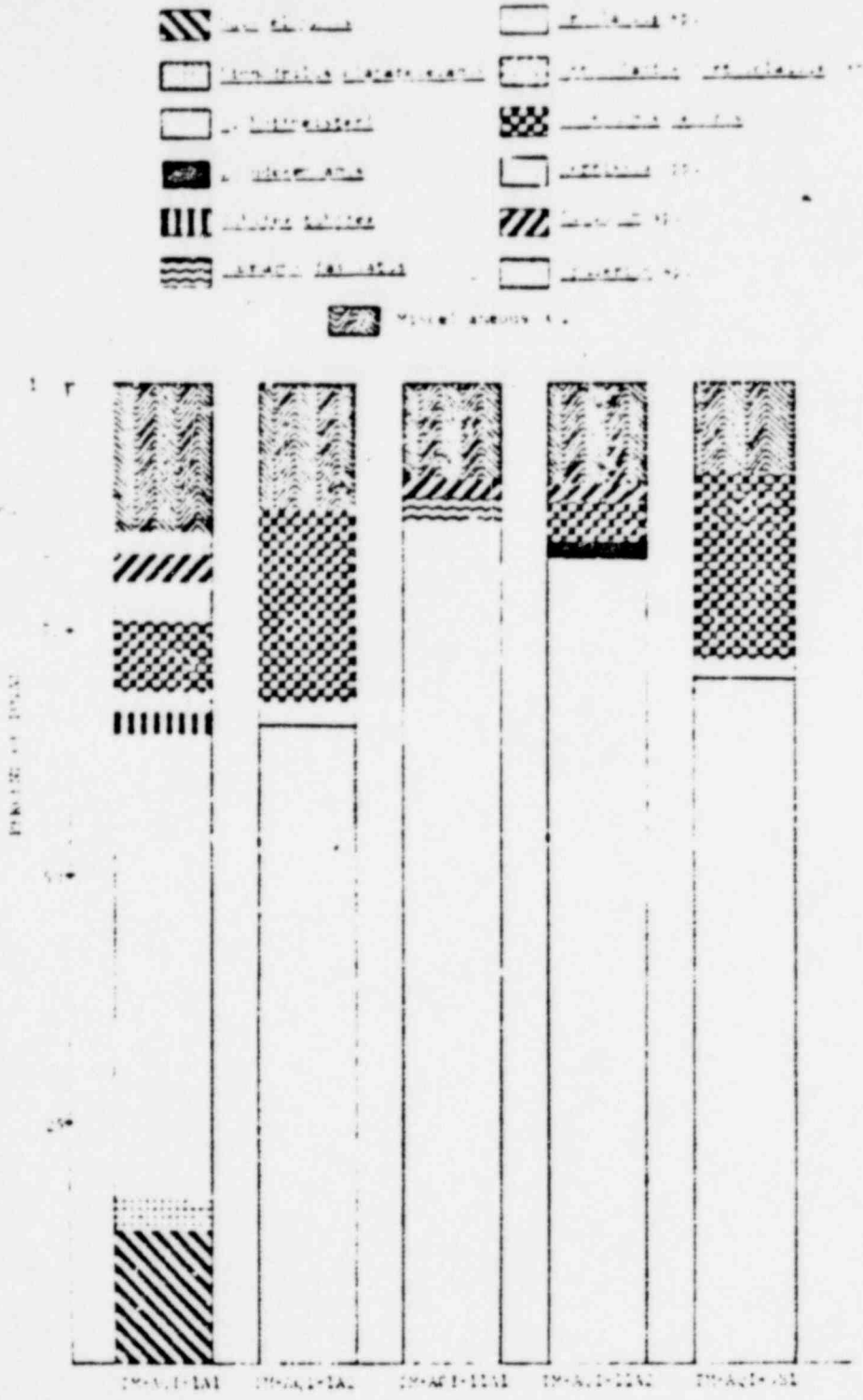

Figure V.2-1. Percent composition of macroinvertebrate taxa, based on the total number of individuals collected at the macroinvertebrate stations, April through October 1976.

1565 202

POOR ORIGINAL

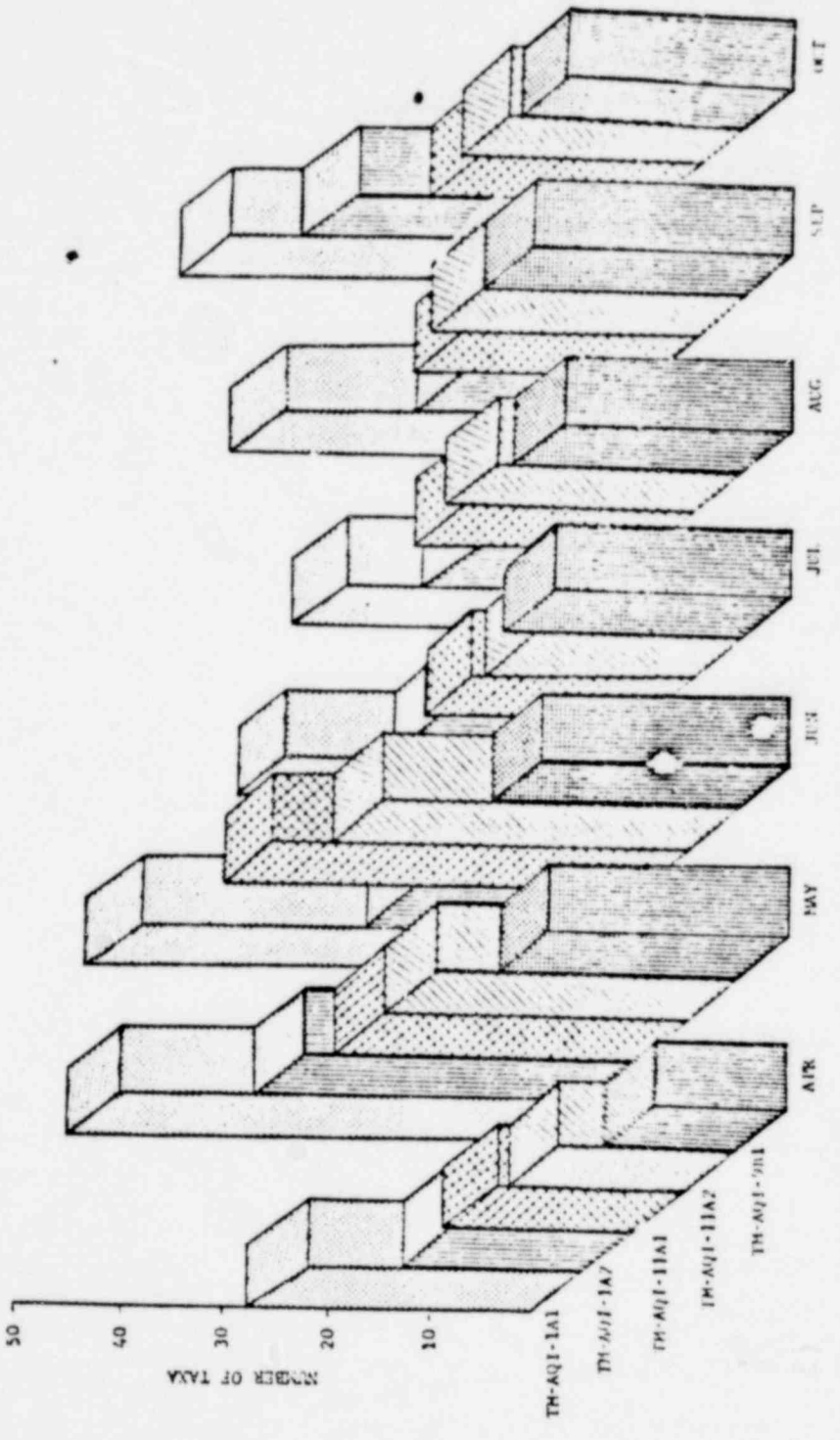

Figure 3.3-1. Numbers of taxa taken at the macroinvertebrate stations, April through October 1976.

1565 203

POOR ORIGINAL

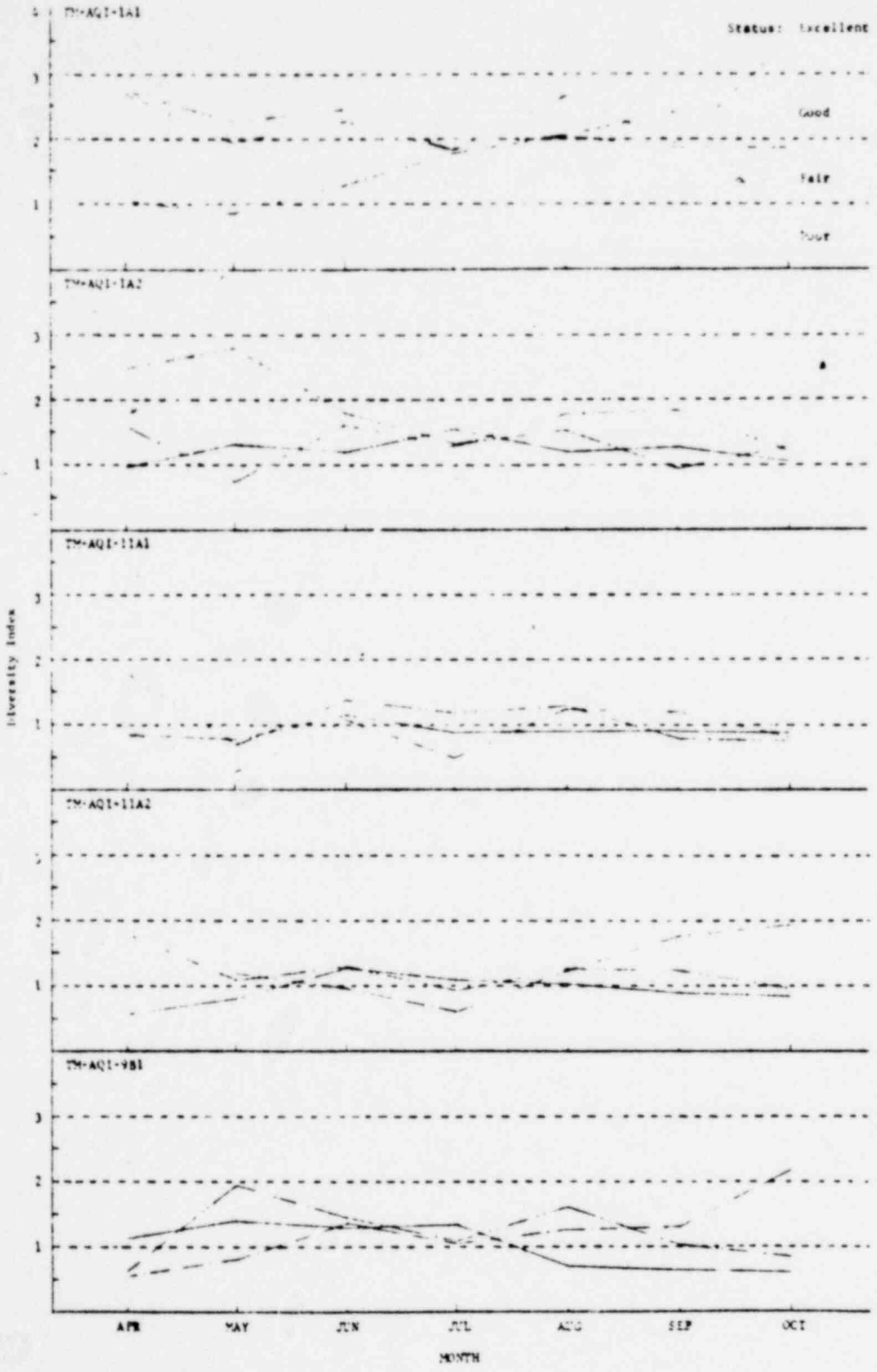

Figure 3.3-2. Diversity (D) values at macroinvertebrate stations April through October 1974 (— · —), 1975 (——), and 1976 (— · · —). "Status" refers to water quality.

1565 204

4.0 AMBIENT WATER QUALITY

The ETS, Appendix B, Section 4.2.2 requires that certain water quality parameters be analyzed semimonthly from April through October in conjunction with macroinvertebrate studies. Results of the 1976 program are given below.

4.1 METHODS

Surface water samples for chemical analyses were collected semimonthly April through October 1976 at each macroinvertebrate station mentioned in Section 3.0 (Table 3.1-1, Figure 3.1-1). Samples were preserved in nalgene bottles and sterilized ground glass bottles (fecal coliform) in the field and transported, in an insulated plastic cooler at approximately 4 C, to the laboratory for analysis. Water quality parameters and methods of determination are given in Table 4.1-1. Dissolved oxygen determinations were made in the field with a YSI Model 54 Oxygen Analyzer.

Geometric means of fecal coliform densities were calculated for all possible combinations of five consecutive samples at each station. These were compared to the limit (200 fecal coliform colonies per 100 ml) established in the "Water Quality Criteria" for the Commonwealth of Pennsylvania (Pennsylvania Department of Environmental Resources 1971).

4.2 RESULTS

4.2.1 PHYSICOCHEMICAL PARAMETERS

Except for dissolved oxygen and total suspended solids, the pattern of monthly distribution of the other parameters was similar (Table 4.2-1).

1565 205

POOR ORIGINAL

Mean values (except dissolved oxygen and suspended solids) were high in September and low in April and May. The mean concentrations of dissolved oxygen were high in October and April and low in July. Suspended solids were high in August and low April through June.

Differences in the concentrations of each parameter between the stations were examined using the data in Tables 4.2-2 through 4.2-8. The monthly mean concentrations of most parameters at Stations 1A1, 1A2, 11A2, and 9B1 generally differed from those at Station 11A1 (TMINS Discharge). Mean values for conductivity, dissolved oxygen, alkalinity, nitrate nitrogen, total phosphates, soluble orthophosphates, sulfates, chlorides, and suspended solids were generally higher at Station 11A1. Differences were generally small. Mean values for other parameters at 11A1 were similar to those found at the other stations.

Mean concentrations of the parameters at Station 1A2 (upstream from the Discharge) and Station 11A2 (downstream from the Discharge) were similar. Any changes in water quality appeared to be limited to the immediate area of the Discharge. Similar conditions were observed in 1974 and 1975 (Potter and Associates 1975, 1976).

Inspection of the mean values of the water quality parameters for 1974 through 1976 indicated that no detectible differences resulted from the operation of TMINS, Unit 1. The requirements of the ETS, Appendix B, Section 4.2.2 have been fulfilled; monitoring will continue as prescribed in the ETS for Unit 2.

1565 206

4.2.2 FECAL COLIFORM

Mean monthly fecal coliform densities were lowest in April (213 colonies per 100 ml); they increased throughout the summer and peaked (10,768 colonies per 100 ml) in September (Table 4.2-1). Densities declined during October. Highest overall mean density was found at Station 1A1 (upstream from the Discharge), which had the highest density on 8 of the 14 sample dates (Tables 4.2-2 through 4.2-8). The lowest overall mean density was found at the Discharge (Station 11A1), which had the lowest density on 5 of the 14 sample dates. No consistent trends among Stations 1A2, 11A2, and 9B1 were noted.

The lowest geometric mean for sets of five consecutive samples at all stations was recorded for the period 6 April through 2 June (Table 4.2-9). The highest geometric mean was recorded at all stations for the periods 20 July through 21 September and 3 August through 5 October. The lowest overall geometric mean occurred at Station 11A1 for the period 6 April through 2 June.

For all stations the geometric mean of fecal coliform densities exceeded the limit established for the Commonwealth of Pennsylvania.

Fecal coliform densities for 1974 through 1976 revealed similar trends. The densities were generally higher at Station 1A1 and lower at Station 11A1. There appeared to be no detectible effect on the growth of bacteria as a result of the operation of TMINS, Unit 1. The ETS requirements for fecal coliform have been completed. Additional collections will be as prescribed in the ETS for Unit 2.

1565 207

Anonymous. 1975. Standard methods for the examination of water and waste water. 14th edition. American Public Health Association, Inc., New York, New York. 1193 pp.

Anonymous. 1974. Methods for chemical analysis of water and wastes. Environmental Protection Agency, Cincinnati, Ohio. 312 pp.

Orion, Research Inc. 1967. Instruction manual halide ions. Cambridge, Massachusetts. 20 pp.

Pennsylvania Department of Environmental Resources. 1971. Water quality criteria, Chapter 93. Rules and regulations, Title 25. Article II, Water resources. 98 pp.

Potter, W.A. and Associates. 1975. An ecological study of the Susquehanna River in the vicinity of the Three Mile Island Nuclear Station. Annual Report for 1974. Ichthyological Associates, Inc. 468 pp.

Potter, W.A. and Associates. 1976. An ecological study of the Susquehanna River in the vicinity of the Three Mile Island Nuclear Station. Annual Report for 1975. Ichthyological Associates, Inc. 395 pp.

POOR ORIGINAL

1565 208

POOR ORIGINAL

Table 4.1-1

Parameter, method used, and reference for analysis of water taken in the vicinity of TMINS in 1976.

Parameter	Method	Reference
pH	Glass electrode	APHA (1975)
Conductivity	Line operated conductivity meter @ 20 C	APHA (1975)
Dissolved Oxygen	YSI Model 54-Oxygen Analyzer	
Total alkalinity	Potentiometric titration	APHA (1975)
Total phosphate	Persulfate digestion; single reagent	EPA (1974)
Orthophosphate	Single reagent	EPA (1974)
Ammonia nitrogen	Specific ion electrode	EPA (1974)
Nitrate nitrogen	U.V. spectrophotometric	APHA (1975)
Nitrite nitrogen	Colorimetric	APHA (1975)
Sulfate	Turbidmetric	EPA (1974)
Chloride	Specific ion electrode	Orion Inc. (19e7)
Suspended solids	Non-filterable residue	APHA (1975)
Fecal coliform	Membrane filter (MF)	APHA (1975) PA DER (1971)

1565 209

POOR ORIGINAL

Table 4.2-1

Monthly mean, minimum, and maximum concentrations of selected water quality parameters taken in the vicinity of [illegible] in 1976. Values are expressed in ppm except for conductivity, pH, and fecal coliform.

Month		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Parameter								
Conductivity (umhos) @ 25° C	Mean	276	293	256	254	246	324	331
	Min.	145	186	209	228	166	244	174
	Max.	370	230	416	340	329	446	333
pH	Mean	-	-	-	-	-	-	-
	Min.	7.24	7.44	7.66	7.64	7.50	7.66	7.26
	Max	8.06	7.98	8.14	7.94	8.17	8.28	7.91
Dissolved Oxygen	Mean	9.1	8.4	8.4	7.4	8.1	8.3	10.6
	Min.	7.7	6.8	7.0	6.9	7.7	7.3	9.2
	Max.	10.3	10.0	9.8	8.2	8.9	9.8	12.4
Total Alkalinity	Mean	34.9	40.8	49.4	45.7	57.7	76.1	32.5
	Min.	23.4	33.2	36.4	39.2	46.4	54.8	28.4
	Max.	52.8	52.0	69.6	55.0	76.2	100.2	38.4
Ammonia nitrogen	Mean	0.07	0.06	0.06	0.06	0.05	0.12	0.22
	Min.	0.05	0.03	0.05	0.05	0.04	0.08	0.17
	Max.	0.12	0.09	0.09	0.07	0.06	0.18	0.25
Nitrate nitrogen	Mean	0.89	0.82	1.02	1.35	1.95	3.02	1.62
	Min.	0.59	0.52	0.48	0.94	0.18	0.41	0.92
	Max.	1.26	1.25	2.19	2.07	4.49	6.14	2.75
Nitrite nitrogen	Mean	0.02	0.03	0.02	0.02	0.03	0.03	0.22
	Min.	0.01	0.01	0.01	0.01	0.01	0.02	0.12
	Max.	0.03	0.06	0.03	0.02	0.02	0.04	0.32
Phosphate, Total	Mean	0.33	0.38	0.42	0.43	0.66	0.67	0.48
	Min.	0.24	0.28	0.26	0.23	0.43	0.52	0.32
	Max.	0.40	0.53	0.64	0.90	0.97	0.85	0.78
Phosphate, Soluble ortho	Mean	0.08	0.11	0.04	0.10	0.17	0.20	0.14
	Min.	0.03	0.03	0.01	0.04	0.01	0.02	0.06
	Max.	0.15	0.23	0.13	0.22	0.28	0.32	0.23
Sulfate	Mean	54.2	50.5	70.2	68.5	55.2	79.5	64.9
	Min.	36.1	36.9	54.1	55.6	24.3	54.6	48.1
	Max.	82.2	64.0	109.8	113.6	96.4	116.6	102.6
Chloride	Mean	11.5	9.7	14.2	12.4	12.6	17.2	10.3
	Min.	8.2	8.9	10.6	11.3	7.4	14.2	9.2
	Max.	13.5	10.5	23.0	17.4	18.1	22.7	13.8
Suspended Solids (Non-filterable)	Mean	22.6	19.3	20.6	38.7	53.4	30.5	39.4
	Min.	5.2	12.4	13.8	16.8	20.8	20.0	24.1
	Max.	49.4	25.2	29.8	142.0	92.8	45.2	57.2
Fecal Coliform (Colonies/100 ml)	Mean	223	1146	3038	3197	4771	10768	2434
	Min.	42	396	1417	1600	1367	2333	500
	Max.	570	2714	4500	7600	17000	44000	5224

1565 210

Table 4.2-2

Summary of selected physicochemical parameters taken on 6 and 20 April 1976 in the vicinity of TMINS. Values are expressed in ppm except for conductivity, pH, and fecal coliform.

Location	Date	Conductivity (umhos) at 20 C	pH	Dissolved Oxygen	Total Alkalinity as $CaCO_3$	NH_3-N	NO_3-N	NO_2-N	PO_4 (Total)	PO_4 (ortho)	SO_4	Cl	Suspended Solids (Non-filterable)	Fecal Coliform (Colonies/ 100 ml)
TM-AQI-1A1	6 Apr	149	7.24	9.8	22.4	0.06	0.80	0.01	0.40	0.03	37.9	8.2	34.2	113
TM-AQI-1A2		145	7.27	9.7	23.6	0.05	0.72	0.01	0.36	0.03	36.1	8.5	41.2	82
TM-AQI-11A1		145	7.40	10.3	24.4	0.08	0.75	0.02	0.36	0.03	36.1	8.5	49.4	85
TM-AQI-11A2		145	7.34	9.9	24.0	0.06	0.74	0.01	0.32	0.03	37.0	8.2	35.6	83
TM-AQI-9B1		145	7.32	9.7	24.8	0.08	0.75	0.01	0.32	0.03	36.1	8.5	28.4	84
TM-AQI-1A1	20 Apr	270	8.06	8.4	35.2	0.06	0.59	0.01	0.24	0.08	82.2	12.0	5.2	135
TM-AQI-1A2		264	7.98	8.1	51.0	0.07	1.26	0.03	0.35	0.15	68.6	12.8	15.2	520
TM-AQI-11A1		268	8.00	7.9	41.6	0.04	0.82	0.02	0.28	0.10	76.8	13.5	7.6	400
TM-AQI-11A2		262	8.02	8.6	50.0	0.10	1.16	0.03	0.36	0.15	68.0	12.8	13.2	340
TM-AQI-9B1		265	7.98	8.2	51.6	0.12	1.25	0.03	0.34	0.15	63.7	12.4	7.8	240
						MEAN VALUES FOR APRIL 1976								
TM-AQI-1A1	Apr	209	-	9.1	28.8	0.06	0.70	0.01	0.32	0.05	60.0	10.1	19.7	124
TM-AQI-1A2		204	-	8.9	37.3	0.06	0.99	0.02	0.36	0.09	52.4	10.6	28.2	326
TM-AQI-11A1		207	-	9.1	33.0	0.06	0.79	0.02	0.32	0.06	56.4	11.0	28.5	243
TM-AQI-11A2		204	-	9.3	37.6	0.08	0.95	0.02	0.34	0.09	52.5	10.5	24.4	212
TM-AQI-9B1		205	-	9.0	38.3	0.10	1.00	0.02	0.33	0.09	44.9	10.5	17.1	162

Table 4.2-3

Summary of selected physicochemical parameters taken on 4 and 18 May 1976 in the vicinity of TMIN. Values are expressed in ppm except for conductivity, pH, and fecal coliform.

Location	Date	Conductivity (umhos) at 20 C	pH	Dissolved Oxygen	Total Alkalinity as $CaCO_3$	NH_3-N	NO_3-N	NO_2-N	PO_4 (Total)	PO_4 (Ortho)	SO_4	Cl	Suspended Solids (Non-filterable)	Fecal Coliform (Colonies/ 100 ml)
TM-AQI-1A1	4 May	190	7.44	9.0	31.6	0.09	0.76	0.01	0.36	0.04	47.5	10.1	21.0	646
TM-AQI-1A2		186	7.54	8.9	33.4	0.07	0.80	0.01	0.33	0.05	48.7	10.5	21.6	596
TM-AQI-11A1		216	7.66	10.0	33.4	0.09	0.76	0.02	0.28	0.06	62.2	10.5	14.8	410
TM-AQI-11A2		192	7.52	8.9	33.2	0.09	0.76	0.02	0.32	0.07	52.3	10.3	21.0	646
TM-AQI-9B1		190	7.50	8.6	33.2	0.09	0.78	0.02	0.29	0.07	48.7	10.1	12.4	530
TM-AQI-1A1	18 May	232	7.98	8.0	43.4	0.03	0.52	0.02	0.34	0.03	64.0	9.2	19.0	2314
TM-AQI-1A2		204	7.52	7.0	37.8	0.08	0.64	0.04	0.47	0.16	55.0	8.9	21.2	1760
TM-AQI-11A1		201	7.86	8.2	52.0	0.08	1.25	0.06	0.53	0.23	36.9	9.0	35.2	1450
TM-AQI-11A2		209	7.56	7.0	38.8	0.07	0.86	0.04	0.45	0.13	50.6	8.9	14.2	1767
TM-AQI-9B1		214	7.58	6.8	50.8	0.08	1.07	0.05	0.49	0.19	50.6	9.4	21.4	1625
						MEAN VALUES FOR MAY 1976								
TM-AQI-1A1	May	211	-	8.5	38.5	0.06	0.64	0.02	0.35	0.04	55.8	9.7	19.9	1480
TM-AQI-1A2		195	-	8.0	40.6	0.08	0.72	0.03	0.40	0.12	48.4	9.7	21.4	1540
TM-AQI-11A1		208	-	9.1	42.7	0.08	1.02	0.04	0.40	0.15	49.5	9.8	25.8	730
TM-AQI-11A2		200	-	8.6	40.0	0.08	0.81	0.03	0.38	0.10	51.3	9.8	17.1	1204
TM-AQI-9B1		202	-	7.7	42.0	0.08	0.92	0.04	0.41	0.13	47.5	9.8	19.1	1178

POOR ORIGINAL

1565 211

Table 4.2-4

Summary of selected physicochemical parameters taken on 1 and 15 June 1976 in the vicinity of IMIN. Values are expressed in ppm except for conductivity, pH, and fecal coliform.

Location	Date	Conductivity (µmhos) at 20 C	pH	Dissolved Oxygen	Total Alkalinity as $CaCO_3$	NH_3-N	NO_3-N	NO_2-N	PO_4 (Total)	PO_4 (ortho)	SO_4	Cl	Suspended Solids (mg/l)	Fecal Coliform (colonies/ 100 ml)
IM-AQI-1A1	1 Jun	216	7.70	9.2	39.4	0.09	0.76	0.01	0.28	0.04	59.1	11.3	24.2	2067
IM-AQI-1A2		215	7.68	9.2	39.4	0.07	0.78	0.01	0.30	0.03	59.1	10.6	21.2	3933
IM-AQI-11A1		212	7.68	9.8	39.4	0.06	0.81	0.01	0.29	0.03	59.1	10.6	19.8	3050
IM-AQI-11A2		214	7.67	9.2	39.4	0.06	0.78	0.01	0.28	0.03	59.1	10.6	18.6	3872
IM-AQI-9B1		209	7.66	9.0	39.2	0.06	0.80	0.01	0.28	0.03	59.1	10.6	19.8	3967
IM-AQI-1A1	15 Jun	246	8.14	7.9	53.4	0.08	0.48	0.02	0.41	0.05	55.1	14.9	14.8	4550
IM-AQI-1A2		276	7.98	7.2	65.4	0.06	1.22	0.02	0.56	0.08	62.9	17.0	22.8	8350
IM-AQI-11A1		416	8.13	7.7	69.6	0.06	2.19	0.03	0.84	0.13	129.8	23.0	28.8	1417
IM-AQI-11A2		275	8.03	7.0	66.8	0.05	1.16	0.02	0.58	0.09	68.4	12.8	21.8	1450
IM-AQI-9B1		283	7.93	8.0	64.4	0.05	1.18	0.02	0.56	0.02	68.4	12.7	14.2	2188
						MEAN VALUES FOR JUNE 1976								
IM-AQI-1A1	Jun	231	-	8.6	41.4	0.08	0.62	0.02	0.35	0.02	57.1	12.2	19.4	3434
IM-AQI-1A2		246	-	8.2	50.9	0.06	1.00	0.02	0.43	0.03	62.0	13.8	22.9	3325
IM-AQI-11A1		314	-	8.8	53.0	0.06	1.50	0.02	0.47	0.08	94.5	18.8	24.2	2234
IM-AQI-11A2		244	-	8.1	51.6	0.06	0.97	0.02	0.43	0.03	63.7	13.2	20.2	3551
IM-AQI-9B1		246	-	8.5	50.3	0.06	0.99	0.02	0.42	0.03	63.7	14.1	16.5	2944

Table 4.2-5

Summary of selected physicochemical parameters taken on 6 and 20 July 1976 in the vicinity of IMIN. Values are expressed in ppm except for conductivity, pH, and fecal coliform.

Location	Date	Conductivity (µmhos) at 20 C	pH	Dissolved Oxygen	Total Alkalinity as $CaCO_3$	NH_3-N	NO_3-N	NO_2-N	PO_4 (Total)	PO_4 (ortho)	SO_4	Cl	Suspended Solids (mg/l)	Fecal Coliform (colonies/ 100 ml)
IM-AQI-1A1	6 Jul	233	7.78	NA	39.4	0.06	1.04	0.01	0.23	0.04	59.9	11.3	17.0	1600
IM-AQI-1A2		234	7.78	NA	41.6	0.06	1.02	0.01	0.25	0.04	62.2	11.3	18.2	1967
IM-AQI-11A1		340	7.94	NA	42.8	0.07	1.77	0.01	0.41	0.08	113.6	17.0	36.0	2050
IM-AQI-11A2		236	7.75	NA	41.2	0.06	1.06	0.01	0.26	0.04	62.2	11.9	16.8	1917
IM-AQI-9B1		236	7.74	NA	40.8	0.07	1.04	0.01	0.26	0.04	59.9	11.3	17.6	1975
IM-AQI-1A1	20 Jul	228	7.64	7.4	39.2	0.07	0.95	0.01	0.31	0.10	67.4	12.8	22.0	1967
IM-AQI-1A2		232	7.69	7.9	47.2	0.05	1.35	0.02	0.54	0.15	81.6	13.3	28.0	4000
IM-AQI-11A1		342	7.91	8.2	55.0	0.05	2.07	0.02	0.90	0.22	78.2	17.4	42.0	4450
IM-AQI-11A2		259	7.71	7.3	51.4	0.06	1.67	0.02	0.62	0.18	64.5	14.4	52.0	4450
IM-AQI-9B1		243	7.66	6.9	48.4	0.06	1.54	0.02	0.56	0.16	55.6	13.3	32.6	7600
						MEAN VALUES FOR JULY 1976								
IM-AQI-1A1	Jul	230	-	7.4	39.3	0.06	0.99	0.01	0.28	0.07	63.6	12.0	19.5	1783
IM-AQI-1A2		235	-	7.3	44.4	0.06	1.18	0.02	0.34	0.09	61.9	12.3	23.1	2983
IM-AQI-11A1		316	-	8.2	48.9	0.06	1.92	0.02	0.66	0.15	95.8	17.2	89.0	3250
IM-AQI-11A2		248	-	7.3	46.3	0.06	1.37	0.02	0.44	0.11	63.4	13.1	36.9	3183
IM-AQI-9B1		240	-	6.9	49.6	0.06	1.29	0.02	0.41	0.10	57.7	12.3	25.1	4787

NA = Not Available.

POOR ORIGINAL

1565 212

Table 4.2-6

Summary of selected physicochemical parameters taken on 3 and 17 August 1976 in the vicinity of IMINCO. Values are expressed in ppm except for conductivity, pH, and fecal coliform.

Location	Date	Conductivity (umhos) at 20 C	pH	Dissolved Oxygen	Total Alkalinity as $CaCO_3$	NH_3-N	NO_3-N	NO_2-N	PO_4 (Total)	PO_4 (Ortho)	SO_4	Cl	Suspended Solids (Non-filterable	Fecal Coliform (colonies/ 100 ml)
IM-AQI-1A1	3 Aug	308	8.17	7.7	52.2	0.05	0.18	0.01	0.43	0.01	96.4	16.0	20.8	17000
IM-AQI-1A2		260	7.84	7.7	73.2	0.06	1.06	0.02	0.54	0.18	44.5	15.2	24.0	1390
IM-AQI-11A1		329	8.06	8.7	76.2	0.05	1.95	0.02	0.67	0.24	74.4	18.1	45.6	1367
IM-AQI-11A2		283	7.87	7.8	73.2	0.04	1.60	0.02	0.58	0.19	55.1	16.3	32.0	2480
IM-AQI-9B1		275	7.88	8.4	68.0	0.05	0.99	0.02	0.50	0.11	74.4	15.6	29.2	1920
IM-AQI-1A1	17 Aug	168	7.53	8.3	46.4	0.06	2.24	0.02	0.81	0.16	24.3	8.0	92.8	3800
IM-AQI-1A2		166	7.50	7.9	48.6	0.04	2.32	0.02	0.71	0.13	24.3	7.4	69.6	2800
IM-AQI-11A1		324	7.94	8.9	46.6	0.04	4.49	0.02	0.97	0.28	89.7	13.6	87.6	5300
IM-AQI-11A2		166	7.54	7.8	46.4	0.04	2.22	0.02	0.71	0.18	31.4	7.6	69.2	5900
IM-AQI-9B1		185	7.54	7.7	46.4	0.04	2.49	0.02	0.65	0.18	37.6	8.0	52.6	5750
						MEAN VALUES FOR AUGUST 1976								
IM-AQI-1A1	Aug	238	-	8.0	49.3	0.06	1.21	0.02	0.62	0.09	60.4	12.0	56.8	10600
IM-AQI-1A2		213	-	7.8	60.9	0.05	1.69	0.02	0.62	0.18	34.4	11.3	46.8	2095
IM-AQI-11A1		326	-	8.8	61.4	0.04	3.22	0.02	0.82	0.26	82.0	15.9	66.6	3334
IM-AQI-11A2		225	-	7.8	59.8	0.04	1.91	0.02	0.65	0.18	43.2	12.0	58.1	4190
IM-AQI-9B1		230	-	8.1	57.2	0.04	1.71	0.02	0.58	0.15	56.0	11.8	43.4	3835

Table 4.2-7

Summary of selected physicochemical parameters taken on 7 and 21 September 1976 in the vicinity of IMINCO. Values are expressed in ppm except for conductivity, pH, and fecal coliform.

Location	Date	Conductivity (umhos) at 20 C	pH	Dissolved Oxygen	Total Alkalinity as $CaCO_3$	NH_3-N	NO_3-N	NO_2-N	PO_4 (Total)	PO_4 (Ortho)	SO_4	Cl	Suspended Solids (Non-filterable)	Fecal Coliform (colonies/ 100 ml)
IM-AQI-1A1	7 Sep	345	8.12	7.8	68.0	0.18	0.41	0.02	0.62	0.06	95.0	17.2	[illegible]	[illegible]
IM-AQI-1A2		336	8.25	9.0	99.2	0.12	3.97	0.05	0.74	0.29	58.4	17.2	[illegible]	[illegible]
IM-AQI-11A1		446	8.26	9.8	100.2	0.08	6.14	0.03	0.85	0.32	116.6	22.7	[illegible]	[illegible]
IM-AQI-11A2		375	8.24	9.0	99.4	0.11	5.40	0.04	0.78	0.2	88.3	18.4	[illegible]	[illegible]
IM-AQI-9B1		350	8.28	8.6	74.4	0.15	1.92	0.03	0.65	0.13	90.2	17.9	[illegible]	[illegible]
IM-AQI-1A1	21 Sep	306	7.68	7.3	54.8	0.14	1.10	0.02	0.52	0.02	[illegible]	16.2	[illegible]	[illegible]
IM-AQI-1A2		244	7.67	8.0	67.6	0.13	2.72	0.03	0.63	0.24	54.6	14.2	[illegible]	[illegible]
IM-AQI-11A1		318	7.90	8.4	65.6	0.09	3.90	0.04	0.75	0.28	82.0	17.7	[illegible]	[illegible]
IM-AQI-11A2		257	7.68	7.6	65.2	0.12	2.81	0.03	0.59	0.24	59.6	14.4	[illegible]	[illegible]
IM-AQI-9B1		266	7.66	7.9	64.4	0.12	2.79	0.03	0.60	0.20	62.2	14.7	[illegible]	[illegible]
						MEAN VALUES FOR SEPTEMBER 1976								
IM-AQI-1A1	Sep	326	-	7.6	61.4	0.16	0.76	0.02	0.57	0.04	[illegible]	17.2	[illegible]	[illegible]
IM-AQI-1A2		290	-	8.5	83.4	0.12	3.34	0.04	0.68	0.29	[illegible]	15.7	[illegible]	[illegible]
IM-AQI-11A1		382	-	9.1	82.9	0.08	5.02	0.03	0.80	0.30	[illegible]	20.2	[illegible]	[illegible]
IM-AQI-11A2		316	-	8.3	[illegible]	0.12	3.61	0.04	0.64	0.26	71.4	[illegible]	[illegible]	[illegible]
IM-AQI-9B1		308	-	8.2	71.4	0.14	2.35	0.03	0.63	[illegible]	76.5	16.3	[illegible]	[illegible]

POOR ORIGINAL

1565 213

Table 4.2-8

Summary of selected physicochemical parameters taken on 5 and 19 October 1976 in the vicinity of TMI. Values are expressed in ppm except for conductivity, pH, and fecal coliform.

Location	Date	Conductivity (umhos) at 25 C	pH	Dissolved Oxygen	Total Alkalinity as $CaCO_3$	NH_3-N	NO_3-N	NO_2-N	PO_4 (total)	PO_4 (ortho)	SO_4	Cl	Suspended Solids (Non-filterable)	Fecal coliform (colonies/100 ml)
TM-AQI-1A1	5 Oct	196	7.35	9.2	32.0	0.09	2.30	0.02	0.50	0.18	51.8	9.3	46.0	5216
TM-AQI-1A2		179	7.38	9.4	38.4	0.08	2.06	0.02	0.51	0.14	45.0	10.1	36.8	4550
TM-AQI-11A1		313	7.50	11.0	36.4	0.08	2.75	0.02	0.26	0.23	102.6	11.9	57.2	4450
TM-AQI-11A2		196	7.38	9.4	35.8	0.07	2.14	0.02	0.53	0.13	44.6	10.6	44.0	4091
TM-AQI-9B1		192	7.38	9.8	35.4	0.08	2.00	0.02	0.47	0.13	51.8	10.3	30.8	3150
TM-AQI-1A1	19 Oct	207	7.36	11.6	28.8	0.14	0.91	0.01	0.36	0.04	70.6	9.4	40.0	533*
TM-AQI-1A2		205	7.26	11.8	29.6	0.15	0.90	0.01	0.42	0.06	65.4	9.4	33.4	533*
TM-AQI-11A1		225	7.28	12.4	29.6	0.15	1.08	0.01	0.49	0.07	75.2	10.3	40.8	567*
TM-AQI-11A2		206	7.28	11.8	29.6	0.14	0.92	0.01	0.45	0.07	68.4	9.1	36.4	300*
TM-AQI-9B1		204	7.33	11.6	29.6	0.15	0.92	0.01	0.32	0.06	66.0	9.3	24.0	200*
MEAN VALUES FOR OCTOBER 1976														
TM-AQI-1A1	Oct	201	-	10.4	30.4	0.12	1.60	0.02	0.43	0.06	61.2	9.6	43.0	2873
TM-AQI-1A2		192	-	10.6	34.0	0.12	1.47	0.02	0.46	0.09	56.7	9.8	40.1	2541
TM-AQI-11A1		269	-	11.7	33.0	0.12	1.92	0.02	0.62	0.15	88.9	12.1	49.0	2508
TM-AQI-11A2		200	-	10.6	32.7	0.11	1.53	0.02	0.49	0.10	59.0	9.8	40.2	2346
TM-AQI-9B1		198	-	10.7	32.5	0.12	1.50	0.02	0.40	0.06	58.9	10.0	27.4	1750

* Non-ideal colony count.

POOR ORIGINAL

1565 214

Table 4.2-9

Combinations of five consecutive samples for determination of the geometric mean of fecal coliform density at ambient water quality stations, April through Octo er 1976.

Station	1A1	1A2	11A1	11A2	9B2		1A1	1A2	11A1	11A2	9B1
6 Apr	113	82	85	82	84	15 Jun	4500	3150	1417	3450	2188
20 Apr	135	570	400	340	240	6 Jul	1600	1967	2050	1917	1975
4 May	646	396	410	640	530	20 Jul	1967	4000	4450	4450	7600
19 May	2714	1700	1050	1767	1625	3 Aug	17000	1390	1367	2480	1920
2 Jun	2364	3500	3050	3652	3100	17 Aug	3800	2800	5300	5900	5750
Geometric mean	576	643	537	651	557	Geometric mean	3911	2494	2479	3364	3250
20 Apr	135	570	400	340	240	6 Jul	1600	1967	2050	1917	1975
4 May	646	396	410	640	530	20 Jul	1967	4000	4450	4450	7600
19 May	2714	1700	1050	1767	1625	3 Aug	17000	1390	1367	2480	1920
2 Jun	2364	3500	3050	3652	3100	17 Aug	3800	2800	5300	5900	5750
15 Jun	4500	3150	1417	3450	2188	7 Sep	44000	7250	4200	9500	5821
Geometric mean	1203	1334	943	1371	1070	Geometric mean	6171	2946	3081	4119	3953
4 May	646	396	410	640	530	20 Jul	1967	4000	4450	4450	7600
19 May	2714	1700	1050	1767	1625	3 Aug	17000	1390	1367	2480	1920
2 Jun	2364	3500	3050	3652	3100	17 Aug	3800	2800	5300	5900	5750
15 Jun	4500	3150	1417	3450	2188	7 Sep	44000	7250	4200	9500	5821
6 Jul	1600	1967	2050	1917	1975	21 Sep	16875	3083	2333	8625	6000
Geometric mean	1972	1710	1307	1938	1631	Geometric mean	9884	3223	3162	5565	4936
19 May	2714	1700	1050	1767	1625	3 Aug	17000	1390	1367	2480	1920
2 Jun	2364	3500	3050	3652	3100	17 Aug	3800	2800	5300	5900	5750
15 Jun	4500	3150	1417	3450	2188	7 Sep	44000	7250	4200	9500	5821
6 Jul	1600	1967	2050	1917	1975	21 Sep	16875	3083	2333	8625	6000
20 Jul	1967	4000	4450	4450	7600	5 Oct	5214	4550	4450	4393	3300
Geometric mean	2464	2715	2106	2856	2778	Geometric mean	12012	3308	3162	5550	4178
2 Jun	2364	3500	3050	3652	3100	17 Aug	3800	2800	5300	5900	5750
15 Jun	4500	3150	1417	3450	2188	7 Sep	44000	7250	4200	9500	5821
6 Jul	1600	1967	2050	1917	1975	21 Sep	16875	3083	2333	8625	6000
20 Jul	1967	4000	4450	4450	7600	5 Oct	5214	4550	4450	4393	3300
3 Aug	17000	1390	1367	2480	1920	19 Oct	533	533	567	300	200
Geometric mean	3557	2608	2220	3056	2872	Geometric mean	6010	2731	2651	3638	2658

POOR ORIGINAL

1565 215

POOR ORIGINAL

5.0 THERMAL PLUME MAPPING

The TMINS plume was monitored to provide temperature data, define the discharge plume, and check the accuracy of the analytical plume model required in the ETS, Appendix B, Section 4.3.1.

5.1 METHODS

The TMINS discharge plume was mapped semimonthly February through November 1976. Additional mappings were conducted during the TMINS refueling shutdown on 21 February. No mappings were conducted in January or December because of ice. Vertical temperature profiles were taken from surface to bottom at 0.5 m intervals with an Endico Digital Thermometer. The thermister was attached to one end of a 3 m pole (marked off in 0.5 m intervals) to allow consistent vertical measurements. Vertical profiles were taken at 5 m, 20 m, and 40 m from shore.

Two control (ambient river temperature) transects were established upstream of the TMINS Discharge at the Unit 1 Intake and 25 m upstream from the Discharge. Indicator transects were established at the Discharge, and 25 m, 50 m, 100 m, 200 m, 400 m, and 1900 m downstream of the Discharge. Markers were placed on shore at each transect. Station operation level, effluent flow rate, intake and discharge temperature, wind speed and direction, and the number of pumps in use (nuclear service, secondary service, and decay heat) were obtained from TMINS. River flow (ft^3/sec measured at the Harrisburg River Forecast Center) and air temperature were also recorded.

A return of the discharge temperature to within 2.7 C of ambient was used to define the plume.

1565 216

POOR ORIGINAL

5.2 RESULTS

The TMINS discharge plume was mapped 33 times in 1976 at various river flow and station operation levels (Tables 5.2-1 through 5.2-33). Surface discharge and ambient river temperature differences are summarized in Table 5.2-34.

The delta T at the Discharge ranged from 0.9 C below to 0.6 C above ambient temperature from April through September (Table 5.2-34). The delta T was within the range established in the ETS, Appendix B, "the discharge temperature shall be no greater than 3 F [1.7 C] below inlet temperature or 7 F [3.9 C] above inlet temperature," for normal operation. From February through March, and October through November the allowable ETS discharge temperature is to be "no greater than 3 F [1.7 C] below inlet temperature or 12 F [6.7 C] above inlet temperature." The delta T ranged from 0.4 C below to 4.6 C above ambient temperature and was within the allowable limits.

The Pennsylvania Code, Title 25, Chapter 97.82 states, "The heat content of discharges shall be limited to an amount which could not raise the temperature of the entire stream at the point of discharge 5 F [2.7 C] above ambient temperature or a maximum of 87 F [30.6 C] , whichever is less." In 28 of 33 surveys the plume was limited to 5 m offshore and 25 m downstream from the Discharge. The dates the plume exceeded these limits were on 16 February and during the cooldown operation for refueling on 21 February. On 16 February the plume extended 5 m offshore and 50 m downstream from the Discharge. The highest ΔT recorded during the cooldown operations was 4.6 C. At 25 m downstream from the Discharge

1565 217

the ΔT was 1.7 C. The ETS, Appendix B states that "during reactor cooldown conditions discharge temperature shall not exceed 20 F [11.1 C] above inlet temperature." This temperature was never exceeded.

The analytical plume model was described in the Final Environmental Statement Related to Operation of Three Mile Island Nuclear Station Units 1 and 2 (A.E.C. 1972) for normal cooldown conditions. This was compared with the ten plume maps taken during the cooldown for refueling of Unit 1. In eight of the ten surveys the plume extended no further than 5 m offshore and to 1000 m downstream from the Discharge, where the temperature was within ten dilutions of the ambient temperature. In the surveys at 2200 hr and 2330 hr on 21 February the plume was detectible 20 m offshore, 25 m downstream from the Discharge. The plume was back to 5 m offshore, 50 m downstream from the Discharge. This varied from the plume model. The model used a river flow of 10,000 cfs; the river flow during the cooldown operations ranged from 193,000 to 229,000 cfs. In the model the plume extends 225 ft (68.6 m) into the river and travels 300 ft (91.4 m) downstream before reaching the 10 dilution criteria. During the cooldown operation the plume extended 5 to 20 m offshore and travel 1000 m downstream from the Discharge.

A.E.C 1972. Final environmental statement related to operation of Three Mile Island Nuclear Station. United States Atomic Energy Commission, Washington, D.C. pp. D30-D34.

Pennsylvania Code. No date. Title 25, Rules and regulations. Chapter 97.82. Industrial wastes, heat, pollution, allowable discharges.

POOR ORIGINAL

Table 5.2-1

Thermal plume data* for TMINS on 16 February 1976.

Station Operation Level (%): 100 Time: 1530
Nuclear Service Pumps: NA Intake Temp. (C): 2.2
Secondary Service Pumps: NA Effluent Temp. (C): 6.9
Decay Heat Pumps: NA Air Temp. (C): 13
Effluent Rate (cfs): 20.1 Wind Speed (mph): 3
River Flow (cfs): 55,600 Wind Dir.: N

Distance from Three Mile Island Shore				
40 m	20 m	5 m	Depth	
2.0	2.1	2.1	S**	Unit 1 Intake
1.9	2.1	2.1	0.5 m	
1.9	2.1	2.1	1.0	
1.9	2.1	2.1	1.5	
1.9	2.1	2.1	2.0	
1.9	2.1	2.1	2.5	
		2.0	3.0	
2.0	2.1	2.1	S	25 m Upstream of
2.0	2.1	2.1	0.5	Discharge
2.0	2.1	2.1	1.0	
2.0	2.1		1.5	
2.0	2.1		2.0	
2.0	2.1		2.5	
2.0	2.1	4.7	S	Discharge (D)
2.0	2.1	5.1	0.5	
2.0	2.1	5.4	1.0	
2.0	2.1	5.6	1.5	
2.0	2.1	5.9	2.0	
2.0	2.1	5.0	S	25 m Downstream of D
2.0	2.1	4.9	0.5	
2.0	2.1	4.9	1.0	
2.0	2.1		1.5	
2.0	2.1		2.0	
2.0	2.1	2.5	S	50 m Downstream of D
2.0	2.1	2.7	0.5	
2.0	2.1	2.8	1.0	
2.0	2.1		1.5	
2.0	2.1		2.0	
2.0	2.1		2.5	
2.0	2.1	2.7	S	100 m Downstream of D
2.0	2.1	2.7	0.5	
2.0	2.1	3.0	1.0	
2.0	2.1		1.5	
2.0	2.1		2.0	
	2.1		2.5	
2.0	2.1	3.3	S	200 m Downstream of D
2.0	2.1	3.3	0.5	
2.0	2.1	3.3	1.0	
2.0	2.1		1.5	
2.0	2.1		2.0	
	2.1		2.5	
2.0	2.1	2.9	S	400 m Downstream of D
2.0	2.1	3.0	0.5	
2.0	2.1	3.0	1.0	
2.0	2.1		1.5	
2.0	2.1		2.0	
2.0			2.5	
2.0			3.0	
2.1	2.1	2.7	S	800 m Downstream of D
2.0	2.1	2.7	0.5	
2.0	2.1	2.7	1.0	
2.0	2.1		1.5	
2.0	2.1		2.0	
2.0	2.1		2.5	

Distance from Three Mile Island Shore				
40 m	20 m	5 m	Depth	
2.1	2.1	2.4	S	1300 m Downstream of D
2.0	2.1	2.5	0.5 m	
2.0	2.1	2.5	1.0	
2.0	2.0		1.5	
2.0	2.0		2.0	
2.0	2.0		2.5	
2.0	2.1	2.4	S	1900 m Downstream of D
2.0	2.1	2.5	0.5	
2.0	2.1	2.5	1.0	
2.0	2.1	2.5	1.5	
2.0	2.1	2.5	2.0	
2.0	2.1		2.5	
2.0			3.0	

* Temperature in C.
** S = Surface.
NA = Not Available.

POOR ORIGINAL

1565 219

Table 5.2-2

Thermal plume data for THINS on 20 February 1976

Station Operation Level (%): 0	Time: 1415
Nuclear Service Pumps: 2	Intake Temp. (C): 1.5
Secondary Service Pumps: 2	Effluent Temp. (C): 3.5
Decay Heat Pumps: 1	Air Temp. (C): 8.2
Effluent Rate (cfs): 37.9	Wind Speed (mph): 6
River Flow (cfs): 220,000	Wind Dir.: W

Distance From Three Mile Island Shore			
20 m	5 m	Depth	
2.4	2.4	S	Unit 1 Intake
2.4	2.4	0.5 m	
2.4	2.4	1.0	
2.4	2.4	1.5	
2.4	2.4	2.0	
2.4	2.4	2.5	
2.4	2.4	3.0	
2.4	2.4	S	25 m Upstream of
2.4	2.4	0.5	Discharge
2.4	2.4	1.0	
2.4	2.4	1.5	
2.4		2.0	
2.4		2.5	
2.4		3.0	
2.4		3.5	
2.4	3.0	S	Discharge (D)
2.4	3.1	0.5	
2.4	3.4	1.0	
2.4	3.6	1.5	
2.4	3.6	2.0	
2.4		2.5	
2.4		3.0	
2.4	2.7	S	25 m Downstream of D
2.4	2.7	0.5	
2.4	2.8	1.0	
2.4	2.8	1.5	
2.4		2.0	
2.4		2.5	
2.4	2.7	S	50 m Downstream of D
2.4	2.7	0.5	
2.4	2.6	1.0	
2.4	2.6	1.5	
2.4		2.0	
2.4		2.5	
2.4		3.0	
	2.7	S	75 m Downstream of D
	2.7	0.5	
	2.7	1.0	
	2.7	1.5	
	2.7	S	100 m Downstream of D
	2.7	0.5	
	2.6	1.0	
	2.6	1.5	
2.4	2.6	S	125 m Downstream of D
2.4	2.5	0.5	
2.4	2.5	1.0	
2.4	2.5	1.5	
2.4	2.5	2.0	
2.4		2.5	
2.4		3.0	

Distance from Three Mile Island Shore			
20 m	5 m	Depth	
2.4	2.6	S	200 m Downstream of D
2.4	2.6	0.5 m	
2.4	2.6	1.0	
2.4	2.6	1.5	
2.4		2.0	
2.4		2.5	
2.4		3.0	
	2.5	S	300 m Downstream of D
	2.5	0.5	
	2.5	1.0	
	2.5	S	400 m Downstream of D
	2.5	0.5	
	2.5	1.0	
2.4	2.5	S	500 m Downstream of D
2.4	2.5	0.5	
2.4	2.5	1.0	
2.4	2.5	1.5	
2.4	2.5	2.0	
2.4		2.5	
2.4		3.0	
2.4	2.5	S	800 m Downstream of D
2.4	2.5	0.5	
2.4	2.5	1.0	
2.4		1.5	
2.4		2.0	
2.4		2.5	
2.4		3.0	
2.4		3.5	
	2.5	S	1000 m Downstream of D
	2.5	0.5	
	2.5	1.0	
	2.5	1.5	
	2.5	2.0	
2.4	2.5	S	1500 m Downstream of D
2.4	2.5	0.5	
2.4	2.5	1.0	
2.4		1.5	
2.4		2.0	
2.4		2.5	
2.4		3.0	
2.4		3.5	

POOR ORIGINAL

1565 220

POOR ORIGINAL

Table 5.2-3

Thermal plume data for TMINS on 21 February 1976.

Station Operation Level (%): 0	Time: 0730
Nuclear Service Pumps: 2	Intake Temp. (C): 1.4
Secondary Service Pumps: 3	Effluent Temp. (C): 2.8
Decay Heat Pumps: 0	Air Temp. (C): 3.0
Effluent Rate (cfs): 55.7	Wind Speed (mph): 8
River Flow (cfs): 25,000	Wind Dir.: SE

Distance From Three Mile Island Shore			
20 m	5 m	Depth	
2.2	2.2	S	Unit 1 Intake
2.2	2.2	0.5 m	
2.2	2.3	1.0	
2.2	2.3	1.5	
2.2	2.3	2.0	
2.2	2.3	2.5	
2.2	2.2	3.0	
2.2	2.3	3.5	
	2.2	4.0	
2.2	2.2	S	25 m Upstream of Discharge
2.2	2.2	0.5	
2.2	2.2	1.0	
2.2	2.2	1.5	
2.2	2.3	2.0	
2.2		2.5	
2.2		3.0	
2.2		3.5	
2.2	2.2	S	Discharge (D)
2.2	2.3	0.5	
2.2	2.2	1.0	
2.2	2.3	1.5	
2.2	2.8	2.0	
2.2		2.5	
2.2		3.0	
2.2		3.5	
2.2	2.4	S	25 m Downstream of D
2.2	2.4	0.5	
2.2	2.4	1.0	
2.2	2.5	1.5	
2.2		2.0	
2.2		2.5	
2.2		3.0	
2.2		3.5	
2.2	2.3	S	50 m Downstream of D
2.2	2.3	0.5	
2.2	2.3	1.0	
2.2	2.4	1.5	
2.2		2.0	
2.2		2.5	
2.2		3.0	
2.2		3.5	
2.2	2.4	S	75 m Downstream of D
2.2	2.4	0.5	
2.2	2.4	1.0	
2.2	2.5	1.5	
2.2		2.0	
2.2		2.5	
2.2		3.0	
2.2		3.5	

Distance From Three Mile Island Shore			
20 m	5 m	Depth	
2.2	2.3	S	100 m Downstream of D
2.2	2.3	0.5 m	
2.2	2.3	1.0	
2.2	2.4	1.5	
2.2	2.4	2.0	
2.2		2.5	
2.2		3.0	
2.2		3.5	
2.2	2.4	S	
2.2	2.3	S	125 m Downstream of D
2.2	2.4	0.5	
2.2	2.4	1.0	
2.2	2.4	1.5	
2.2		2.0	
2.2		2.5	
2.2		3.0	
2.2	2.2	S	200 m Downstream of D
2.2	2.4	0.5	
2.2	2.4	1.0	
2.2	2.4	1.5	
2.2		2.0	
2.2		2.5	
2.2		3.0	
2.2		3.5	
2.2	2.3	S	400 m Downstream of D
2.2	2.3	0.5	
2.2	2.2	1.0	
2.2	2.3	1.5	
2.2		2.0	
2.2		2.5	
2.2		3.0	
2.2		3.5	
2.2		4.0	
2.2	2.3	S	800 m Downstream of D
2.2	2.3	0.5	
2.2	2.3	1.0	
2.2	2.3	1.5	
2.2		2.0	
2.2		2.5	
2.2		3.0	

1565 221

Table 5.2-4

Thermal plume data for TMINS on 21 February 1976.

POOR ORIGINAL

Station Operation Level (%): 0	Time: 0815
Nuclear Service Pumps: 2	Intake Temp. (C): 1.3
Secondary Service Pumps: 3	Effluent Temp. (C): 2.8
Decay Heat Pumps: 0	Air Temp. (C): 3.0
Effluent Rate (cfs): 44.6	Wind Speed (mph): 6
River Flow (cfs): 200,000	Wind Dir.: ESE

Distance From Three Mile Island Shore			
20 m	5 m	Depth	
2.2	2.2	S	Unit 1 Intake
2.2	2.2	0.5 m	
2.2	2.2	1.0	
2.2	2.2	1.5	
2.2	2.2	2.0	
2.2	2.2	2.5	
2.2	2.2	3.0	
2.2	2.2	3.5	
	2.2	4.0	
2.2	2.3	S	25 m Upstream of Discharge
2.2	2.2	0.5	
2.2	2.2	1.0	
2.2	2.2	1.5	
2.2		2.0	
2.2		2.5	
2.2		3.0	
2.2		3.5	
2.2	2.7	S	Discharge (D)
2.2	2.7	0.5	
2.2	2.7	1.0	
2.2	2.7	1.5	
2.2	2.7	2.0	
2.2	2.8	2.5	
2.2		3.0	
2.2	2.4	S	25 m Downstream of D
2.2	2.5	0.5	
2.2	2.5	1.0	
2.2		1.5	
2.2		2.0	
2.2		2.5	
2.2		3.0	
2.2		3.5	
2.2	2.4	S	50 m Downstream of D
2.2	2.4	0.5	
2.2	2.4	1.0	
2.2		1.5	
2.2		2.0	
2.2		2.5	
2.2		3.0	
2.2		3.5	
2.2	2.3	S	75 m Downstream of D
2.2	2.3	0.5	
2.2	2.3	1.0	
2.2	2.4	1.5	
2.2		2.0	
2.2		2.5	
2.2		3.0	
2.2		3.5	
2.2	2.3	S	100 m Downstream of D
2.2	2.3	0.5	
2.2	2.3	1.0	
2.2	2.3	1.5	
2.2	2.4	2.0	
2.2		2.5	
2.2		3.0	
2.2		3.5	

Distance From Three Mile Island Shore			
20 m	5 m	Depth	
2.2	2.4	S	125 m Downstream of D
2.2	2.4	0.5 m	
2.2	2.4	1.0	
2.2		1.5	
2.2		2.0	
2.2		2.5	
2.2		3.0	
2.2		3.5	
2.2	2.4	S	200 m Downstream of D
2.2	2.4	0.5	
2.2	2.4	1.0	
2.2	2.4	1.5	
2.2		2.0	
2.2		2.5	
2.2		3.0	
2.2		3.5	
2.2	2.3	S	400 m Downstream of D
2.2	2.3	0.5	
2.2	2.3	1.0	
2.2	2.3	1.5	
2.2		2.0	
2.2		2.5	
2.2		3.0	
2.2		3.5	
2.2	2.3	S	800 m Downstream of D
2.2	2.3	0.5	
2.2	2.3	1.0	
2.2	2.3	1.5	
2.2		2.0	
2.2		2.5	
2.2		3.0	
2.2		3.5	
2.2	2.3	S	1000 m Downstream of D
2.2	2.3	0.5	
2.2	2.3	1.0	
2.2	2.3	1.5	
2.2	2.3	2.0	
2.2		2.5	
2.2		3.0	

1565 222

POOR ORIGINAL

Table 5.2-5

Thermal plume data for TMINS on 21 February 1979.

Station Operation Level (): 0	Time: 1000
Nuclear Service Pumps: 2	Intake Temp. (C): 1.4
Secondary Service Pumps: 3	Effluent Temp. (C): 2.8
Decay Heat Pumps: 0	Air Temp. (C): 8.0
Effluent Rate (cfs): 44.6	Wind Speed (mph): 10
River Flow (cfs): [illegible]	Wind Dir.: S

Distance from Three Mile Island Shore			
20 m	5 m	Depth	
2.2	2.3	S	Unit 1 Intake
2.2	2.3	0.5 m	
2.2	2.3	1.0	
2.2	2.3	1.5	
2.2	2.3	2.0	
2.2	2.3	2.5	
2.2	2.3	3.0	
2.2	2.3	3.5	
2.2	2.3	4.0	
2.2	2.2	S	25 m Upstream of Discharge
2.2	2.2	0.5	
2.2	2.2	1.0	
2.2	2.2	1.5	
2.2		2.0	
2.2		2.5	
2.2		3.0	
2.2		3.5	
2.2	2.6	S	Discharge (D)
2.2	2.7	0.5	
2.2	2.7	1.0	
2.2	2.6	1.5	
2.2	2.6	2.0	
2.2	2.7	2.5	
2.2	2.8	3.0	
2.2	2.5	S	25 m Downstream of D
2.2	2.5	0.5	
2.2	2.5	1.0	
2.2		1.5	
2.2		2.0	
2.2		2.5	
2.2		3.0	
2.2		3.5	
2.2	2.4	S	50 m Downstream of D
2.2	2.4	0.5	
2.2	2.5	1.0	
2.2		1.5	
2.2		2.0	
2.2		2.5	
2.2		3.0	
2.2		3.5	
2.2	2.4	S	75 m Downstream of D
2.2	2.4	0.5	
2.2	2.4	1.0	
2.2	2.5	1.5	
2.2		2.0	
2.2		2.5	
2.2		3.0	
2.2		3.5	
2.2	2.4	S	100 m Downstream of D
2.2	2.5	0.5	
2.2	2.4	1.0	
2.2	2.4	1.5	
2.2		2.0	
2.2		2.5	
2.2		3.0	
2.2		3.5	

Distance from Three Mile Island Shore			
20 m	5 m	Depth	
2.2	2.4	S	200 m Downstream of D
2.2	2.4	0.5 m	
2.2	2.4	1.0	
2.2	2.4	1.5	
2.2		2.0	
2.2		2.5	
2.2		3.0	
2.2		3.5	
2.2	2.3	S	400 m Downstream of D
2.2	2.3	0.5	
2.2	2.3	1.0	
2.2	2.3	1.5	
2.2		2.0	
2.2		2.5	
2.2		3.0	
2.2		3.5	
2.2	2.3	S	600 m Downstream of D
2.2	2.3	0.5	
2.2	2.3	1.0	
2.2		1.5	
2.2		2.0	
2.2		2.5	
2.2		3.0	
2.2		3.5	

1565 223

Table 5.2-6

Thermal plume data for TMI-2 on 21 February 1976.

POOR ORIGINAL

Unit 1 operation Level = 0	T = 14.5
Circ. Water Pumps: 2	Lake Temp. (C): 1.6
Circ. Water Pumps: 2	Effluent Temp. (C): 3.8
Heat Pumps: 0	Air Temp. (C): 15.0
Effluent Rate (cfs): 37.9	Wind Speed (mph): 8
[illegible]	[illegible]

Distance from Three Mile Island Intake			
20 m	5 m	Depth	
2.5	2.5	S	Unit 1 Intake
2.5	2.5	0.5 m	
2.5	2.5	1.0	
2.5	2.5	1.5	
2.5	2.5	2.0	
2.5	2.5	2.5	
2.5	2.5	3.0	
2.5	2.5	3.5	
2.5	2.5	4.0	
	2.5	4.5	
2.6	2.6	S	25 m Upstream of Discharge
2.6	2.6	0.5	
2.6	2.6	1.0	
2.6		1.5	
2.6		2.0	
2.6		2.5	
2.6		1.0	
2.6		3.5	
2.6	2.6	S	Discharge (D)
2.6	2.6	0.5	
2.6	2.6	1.0	
2.6	2.6	1.5	
2.6	3.0	2.0	
2.6	3.1	2.5	
2.6		3.0	
2.6	2.6	S	25 m Downstream of D
2.6	2.6	0.5	
2.6	2.6	1.0	
2.6		1.5	
2.6		2.0	
2.6		2.5	
2.6	2.7	S	50 m Downstream of D
2.6	2.6	0.5	
2.6	2.6	1.0	
2.6		1.5	
2.6		2.0	
2.6		2.5	
2.6		3.0	
2.6	2.6	S	100 m Downstream of D
2.6	2.6	0.5	
2.6		1.0	
2.6		1.5	
2.6		2.0	
2.6		2.5	
2.6		3.0	
2.6	2.6	S	200 m Downstream of D
2.6	2.6	0.5	
2.6	2.6	1.0	
2.6	2.6	1.5	
2.6		2.0	
2.6		2.5	
2.6		3.0	

Distance from Three Mile Island Shore			
20 m	5 m	Depth	
2.6	2.7	S	400 m Downstream of I
2.6	2.7	0.5 m	
2.6	2.7	1.0	
2.6		1.5	
2.6		2.0	
2.6		2.5	
2.6		3.0	
2.6	2.7	S	500 m Downstream of I
2.6	2.7	0.5	
2.6	2.7	1.0	
2.6	2.7	1.5	
2.6		2.0	
2.6		2.5	
2.6		3.0	
2.6	2.7	S	700 m Downstream of I
2.6	2.7	0.5	
2.6	2.7	1.0	
2.6	2.7	1.5	
2.6		2.0	
2.6		2.5	
2.6		3.0	
2.6	2.7	S	800 m Downstream of I
2.6	2.7	0.5	
2.6	2.7	1.0	
2.6		1.5	
2.6		2.0	
2.6		2.5	
2.6	2.6	S	1000 m Downstream of I
2.6	2.6	0.5	
2.6	2.6	1.0	
2.6		1.5	
2.6		2.0	
2.6		2.5	
2.6		3.0	

1565 224

Table 5.2-7

Thermal plume data for TMINS on 21 February 1976.

POOR ORIGINAL

Station Operation Level (%): 0	Time: 1615
Nuclear Service Pumps: 1	Intake Temp. (C): 1.9
Secondary Service Pumps: 2	Effluent Temp. (C): 4.4
Decay Heat Pumps: 0	Air Temp. (C): 10.5
Effluent Rate (cfs): 44.6	Wind Speed (mph): 10
River Flow (cfs): 214,000	Wind Dir.: S

Distance from Three Mile Island Shore			
20 m	5 m	Depth	
2.8	2.7	S	Unit 1 Intake
2.8	2.7	0.5 m	
2.8	2.7	1.0	
2.7	2.7	1.5	
2.7	2.7	2.0	
2.7	2.7	2.5	
2.7	2.7	3.0	
	2.7	3.5	
	2.7	4.0	
2.7	2.7	S	25 m Upstream of Discharge
2.7	2.7	0.5	
2.7	2.7	1.0	
2.7	2.7	1.5	
2.7		2.0	
2.7		2.5	
2.7		3.0	
2.7	3.3	S	Discharge (D)
2.7	3.4	0.5	
2.7	3.4	1.0	
2.7	3.4	1.5	
2.7	3.4	2.0	
2.7	3.4	2.5	
2.7	3.5	3.0	
2.7	3.2	S	25 m Downstream of D
2.7	3.2	0.5	
2.7	3.2	1.0	
2.7		1.5	
2.7		2.0	
2.7		2.5	
2.7		3.0	
2.7	3.2	S	50 m Downstream of D
2.7	3.2	0.5	
2.7	3.2	1.0	
2.7		1.5	
2.7		2.0	
2.7		2.5	
2.7		3.0	
2.7	3.0	S	100 m Downstream of D
2.7	3.0	0.5	
2.7	3.0	1.0	
2.7	3.0	1.5	
2.7		2.0	
2.7		2.5	
2.7		3.0	
2.7	3.0	S	200 m Downstream of D
2.7	3.0	0.5	
2.7	3.0	1.0	
2.7	3.0	1.5	
2.7		2.0	
2.7		2.5	
2.7		3.0	

Distance from Three Mile Island Shore			
[illegible]	5 m	Depth	
2.8	2.9	S	400 m Downstream of D
2.8	2.9	0.5 m	
2.8	2.9	1.0	
2.8	2.9	1.5	
2.8		2.0	
2.8		2.5	
2.8	2.9	S	500 m Downstream of D
2.8	2.9	0.5	
2.8	2.9	1.0	
2.8	2.9	1.5	
2.8		2.0	
2.8		2.5	
2.8		3.0	
2.8		3.5	
2.8	2.8	S	700 m Downstream of D
2.8	2.8	0.5	
2.8	2.8	1.0	
2.8	2.8	1.5	
2.8		2.0	
2.8		2.5	
2.8		3.0	
2.8	2.8	S	800 m Downstream of D
2.8	2.8	0.5	
2.8	2.8	1.0	
2.8		1.5	
2.8		2.0	
2.8		2.5	
2.8	2.8	S	1000 m Downstream of D
2.8	2.8	0.5	
2.8	2.8	1.0	
2.8	2.8	1.5	
2.8		2.0	
2.8		2.5	
2.8		3.0	
2.8		3.5	

1565 225

POOR ORIGINAL

Table 5.2-8

Thermal pulme data for TMI-1 on 21 February 1976.

Station operation level (MWt): 0	Time: 2710
Nuclear service pumps: 2	Intake Temp. (C): 1.8
Secondary service Pumps: 3	Effluent Temp. (C): 3.9
Decay Heat Pumps: 0	Air Temp. (C): 12.0
Effluent Rate (cfs): 44.6	Wind Speed (mph): 9
River Flow (cfs): [illegible]	[illegible]

Distance from Three Mile Island Shore			
20 m	5 m	Depth	
2.6	2.7	S	Unit 1 Intake
2.6	2.7	0.5 m	
2.6	2.7	1.0	
2.6	2.7	1.5	
2.6	2.7	2.0	
2.6	2.7	2.5	
2.6	2.7	3.0	
2.6		3.5	
2.7	2.7	S	25 m Upstream of Discharge
2.7	2.7	0.5	
2.7	2.7	1.0	
2.7	2.7	1.5	
2.7	2.7	2.0	
2.7		2.5	
2.7		3.0	
2.7	3.1	S	Discharge (D)
2.7	3.1	0.5	
2.7	3.1	1.0	
2.7	3.2	1.5	
2.7	3.2	2.0	
2.7		2.5	
2.7		3.0	
2.7	3.1	S	25 m Downstream of D
2.7	3.1	0.5	
2.7	3.1	1.0	
2.7		1.5	
2.7		2.0	
2.7		2.5	
2.7		3.0	
2.7	3.0	S	50 m Downstream of D
2.7	3.0	0.5	
2.7	2.9	1.0	
2.7		1.5	
2.7		2.0	
2.7		2.5	
2.7		3.0	
2.7	2.8	S	100 m Downstream of D
2.7	2.8	0.5	
2.7	2.8	1.0	
2.7	2.8	1.5	
2.7		2.0	
2.7		2.5	
2.7		3.0	
2.7		3.5	
2.7	2.8	S	200 m Downstream of D
2.7	2.8	0.5	
2.7	2.8	1.0	
2.7	2.8	1.5	
2.7	2.8	2.0	
2.7		2.5	
2.7		3.0	

Distance from Three Mile Island Shore			
20 m	5 m	Depth	
2.7	2.6	S	400 m Downstream of D
2.7	2.6	0.5 m	
2.7	2.6	1.0	
2.7	2.6	1.5	
2.7		2.0	
2.7		2.5	
2.7		3.0	
2.7	2.6	S	500 m Downstream of D
2.7	2.6	0.5	
2.7	2.6	1.0	
2.7	2.6	1.5	
2.7	2.6	2.0	
2.7		2.5	
2.7		3.0	
2.7		3.5	
2.7		4.0	
2.7	2.6	S	700 m Downstream of D
2.7	2.6	0.5	
2.7	2.6	1.0	
2.7	2.6	1.5	
2.7		2.0	
2.7		2.5	
2.7		3.0	
2.7		3.5	
2.7		4.0	
2.7	2.6	S	850 m Downstream of D
2.7	2.6	0.5	
2.7	2.6	1.0	
2.7		1.5	
2.7		2.0	
2.7		2.5	
2.7		3.0	
2.7		3.5	
2.7	2.6	S	1000 m Downstream of D
2.7	2.6	0.5	
2.7	2.6	1.0	
2.7	2.6	1.5	
2.7		2.0	
2.7		2.5	
2.7		3.0	
2.7		3.5	

1565 226

Table 5.2-9

Thermal plume data for TMINS on 21 February 1976.

Station Operation Level (%): 0	Time: 2105
Nuclear Service Pumps: 3	Intake Temp. (C): 2.0
Secondary Service Pumps: 2	Effluent Temp. (C): 6.7
Decay Heat Pumps: 2	Air Temp. (C): 11.0
Effluent Rate (cfs): 111.4	Wind Speed (mph): 9
River Flow (cfs): 209,000	Wind Dir.: S

Distance From Three Mile Island Shore			
20 m	5 m	Depth	
2.8	2.8	S	Unit 1 Intake
2.8	2.8	0.5 m	
2.8	2.8	1.0	
2.8	2.8	1.5	
2.8	2.8	2.0	
2.8	2.8	2.5	
2.8	2.8	3.0	
2.8	2.8	3.5	
	2.8	4.0	
2.8	2.8	S	25 m Upstream of Discharge
2.8	2.8	0.5	
2.8	2.8	1.0	
2.8		1.5	
2.8		2.0	
2.8		2.5	
2.8		3.0	
2.8	5.2	S	Discharge (D)
2.8	5.6	0.5	
2.8	5.2	1.0	
2.8	5.2	1.5	
2.8	5.2	2.0	
2.8	5.2	2.5	
2.8	4.9	3.0	
2.8	4.1	S	25 m Downstream of D
2.8	4.1	0.5	
2.8	4.2	1.0	
2.8		1.5	
2.8		2.0	
2.8		2.5	
2.8		3.0	
2.8	4.2	S	50 m Downstream of D
2.8	4.2	0.5	
2.8	4.2	1.0	
2.8		1.5	
2.8		2.0	
2.8		2.5	
2.8		3.0	
2.8		3.5	
2.9	4.0	S	100 m Downstream of D
2.8	4.0	0.5	
2.8	4.0	1.0	
2.8	4.1	1.5	
2.8		2.0	
2.8		2.5	
2.8		3.0	
2.8		3.5	
2.9	3.6	S	200 m Downstream of D
2.9	3.6	0.5	
2.9	3.6	1.0	
2.9		1.5	
2.9		2.0	
2.9		2.5	
3.0		3.0	
3.0		3.5	

Distance From Three Mile Island Shore			
20 m	5 m	Depth	
3.0	3.3	S	400 m Downstream of D
3.0	3.3	0.5 m	
2.9	3.3	1.0	
2.9	3.3	1.5	
3.0	3.3	2.0	
3.0		2.5	
3.0	3.3	S	500 m Downstream of D
3.0	3.3	0.5	
3.0	3.3	1.0	
3.0	3.2	1.5	
3.0		2.0	
3.0		2.5	
3.0		3.0	
3.0	3.1	S	700 m Downstream of D
3.0	3.1	0.5	
3.0	3.1	1.0	
3.0	3.1	1.5	
3.0		2.0	
3.0		2.5	
3.1		3.0	
2.9	3.1	S	800 m Downstream of D
2.9	3.1	0.5	
2.9	3.1	1.0	
2.9		1.5	
3.0		2.0	
3.0		2.5	
3.0		3.0	
3.0	3.0	S	1000 m Downstream of D
3.0	3.0	0.5	
3.0	3.0	1.0	
3.0	3.0	1.5	
3.0		2.0	
2.9		2.5	
2.9		3.0	

POOR ORIGINAL

1565 227

POOR ORIGINAL

Table 5.2-19

Thermal plume data for TMINS on 21 February 1976.

Station Operation Level (MWt): 0	Time: 2200
Nuclear Service Pumps: 2	Intake Temp. (°C): 2.1
Secondary Service Pumps: 2	Effluent Temp. (°C): 6.4
Decay Heat Pumps: 2	Air Temp. (°C): NA
Effluent Rate (cfs): 221.4	Wind Speed (mph): 7
River Flow (cfs): [illegible]	Wind Dir.: S

Distance from Three Mile Island Shore			
20 m	5 m	Depth	
2.9	2.9	S	Unit 1 Intake
2.9	2.8	0.5 m	
2.9	2.8	1.0	
2.9	2.8	1.5	
2.9	2.8	2.0	
2.9	2.8	2.5	
2.9	2.8	3.0	
2.9	2.8	3.5	
	2.8	4.0	
2.9	2.9	S	25 m Upstream of Discharge
2.9	2.9	0.5	
2.9	2.9	1.0	
2.9	2.9	1.5	
2.9		2.0	
2.9		2.5	
2.9		3.0	
2.9	5.2	S	Discharge (D)
2.9	5.2	0.5	
2.9	6.3	1.0	
2.9	6.7	1.5	
2.9	5.6	2.0	
2.9	5.3	2.5	
2.9	5.2	3.0	
3.5	4.3	S	25 m Downstream of D
3.4	4.3	0.5	
3.3	4.3	1.0	
3.3		1.5	
3.3		2.0	
3.3		2.5	
2.9	4.2	S	50 m Downstream of D
2.9	4.2	0.5	
2.9	4.2	1.0	
2.9		1.5	
2.9		2.0	
2.9		2.5	
2.9		3.0	
3.1	4.1	S	100 m Downstream of D
3.0	4.1	0.5	
3.0	4.1	1.0	
3.0		1.5	
3.0		2.0	
3.0		2.5	
2.9		3.0	
2.9	3.9	S	200 m Downstream of D
2.9	3.9	0.5	
2.9	3.9	1.0	
2.9		1.5	
2.9		2.0	
2.9		2.5	
2.9		3.0	
2.9		3.5	

Distance from Three Mile Island Shore			
20 m	5 m	Depth	
[illegible]	[illegible]	S	400 m Downstream of D
2.9	3.5	0.5 m	
2.9	3.5	1.0	
2.9	3.5	1.5	
2.9	3.5	2.0	
2.9		2.5	
2.9		3.0	
2.9	3.5	S	500 m Downstream of D
2.9	3.5	0.5	
2.9	3.5	1.0	
2.9	3.5	1.5	
2.9		2.0	
2.9		2.5	
2.9		3.0	
2.9		3.5	
2.9	3.4	S	700 m Downstream of D
2.9	3.4	0.5	
2.9	3.4	1.0	
2.9	3.4	1.5	
2.9		2.0	
2.9		2.5	
2.9		3.0	
2.9		3.5	
2.9		4.0	
2.9	3.3	S	800 m Downstream of D
2.9	3.3	0.5	
2.9	3.3	1.0	
2.9		1.5	
2.9		2.0	
2.9		2.5	
2.9		3.0	
2.9		3.5	
3.0	3.2	S	1000 m Downstream of D
3.0	3.2	0.5	
3.0	3.2	1.0	
3.0	3.2	1.5	
3.0		2.0	
3.0		2.5	

1565 228

POOR ORIGINAL

Table 5.2-11

Thermal plume data for TMINS on 21 February 1976.

Station Operation Level (%): 0	Time: 2330
Nuclear Service Pumps: 2	Intake Temp. (C): 2.2
Secondary Service Pumps: 3	Effluent Temp. (C): 6.9
Decay Heat Pumps: 1	Air Temp. (C): NA
Effluent Rate (cfs): 115.9	Wind Speed (mph): 10
River Flow (cfs): 203,000	Wind Dir.: S

Distance from Three Mile Island shore			
20 m	5 m	Depth	
3.0	3.0	S	Unit 1 Intake
3.0	3.0	0.5 m	
3.0	3.0	1.0	
3.0	3.0	1.5	
3.0	3.0	2.0	
3.0	3.0	2.5	
3.0	3.0	3.0	
3.0	3.0	3.5	
	3.0	4.0	
3.0	3.0	S	25 m Upstream of Discharge
3.0	3.0	0.5	
3.0	3.0	1.0	
3.0	3.0	1.5	
3.0		2.0	
3.0		2.5	
3.0	7.6	S	Discharge (D)
3.0	6.0	0.5	
3.0	7.0	1.0	
3.0	7.3	1.5	
3.0	7.3	2.0	
3.0	7.4	2.5	
3.0	7.3	3.0	
3.1	4.7	S	25 m Downstream of D
3.1	4.7	0.5	
3.1	4.7	1.0	
3.4		1.5	
3.6		2.0	
3.7		2.5	
3.3	4.6	S	50 m Downstream of D
3.1	4.7	0.5	
3.1	4.7	1.0	
3.1		1.5	
3.1		2.0	
3.0		2.5	
3.0		3.0	
3.0		3.5	
3.1	4.3	S	100 m Downstream of D
3.1	4.3	0.5	
3.1	4.4	1.0	
3.1	4.4	1.5	
3.0		2.0	
3.0		2.5	
3.0		3.0	
3.0		3.5	
3.4	4.0	S	200 m Downstream of D
3.3	4.0	0.5	
3.3	4.0	1.0	
3.2	4.0	1.5	
3.2		2.0	
3.1		2.5	
3.1		3.0	

Distance from Three Mile Island Shore			
20 m	5 m	Depth	
3.1	3.7	S	400 m Downstream of D
3.1	3.7	0.5 m	
3.1	3.7	1.0	
3.1	3.7	1.5	
3.1	3.7	2.0	
3.1		2.5	
3.1		3.0	
3.2	3.6	S	500 m Downstream of D
3.1	3.6	0.5	
3.1	3.6	1.0	
3.2	3.6	1.5	
3.2		2.0	
3.2		2.5	
3.2		3.0	
3.2		3.5	
3.2	3.5	S	700 m Downstream of D
3.1	3.5	0.5	
3.1	3.5	1.0	
3.2		1.5	
3.2		2.0	
3.2		2.5	
3.2		3.0	
3.2	3.4	S	800 m Downstream of D
3.2	3.4	0.5	
3.2	3.4	1.0	
3.2		1.5	
3.3		2.0	
3.3		2.5	
3.2	3.4	S	1000 m Downstream of D
3.2	3.4	0.5	
3.2	3.4	1.0	
3.2	3.4	1.5	
3.2		2.0	
3.2		2.5	

1565 229

POOR ORIGINAL

Table 5.2-12

Thermal plume data for [illegible] on 22 February 1976.

Station Operation Level (MWt): 0	Time: 1100
Nuclear Service Pumps: 2	Intake Temp. (C): 2.8
Secondary Service Pumps: 3	Effluent Temp. (C): 6.3
Heavy Heat Pumps: 2	Air Temp. (C): NA
Effluent Rate (cfs): 111.4	Wind Speed (mph): 20
Total Flow (cfs): 1[illegible]	Wind Dir.

Distance from Three Mile Island Shore				Distance from Three Mile Island Shore			
20 m	5 m	Depth		20 m	5 m	Depth	
3.1	3.1	S	Unit 1 Intake	3.2	3.4	S	450 m Downstream of I
3.1	3.1	0.5 m		3.2	3.4	0.5 m	
3.1	3.1	1.0		3.2	3.7	1.0	
3.1	3.1	1.5		3.2	3.7	1.5	
3.1	3.1	2.0		3.4	3.7	2.0	
3.1	3.1	2.5		3.5		2.5	
3.1	3.1	3.0		3.2		3.0	
3.1	3.1	3.5					
	3.1	4.0		3.3	3.7		500 m Downstream of I
				3.3	3.4	0.5	
3.1	3.2	S	25 m Upstream of Discharge	3.3	3.4	1.0	
3.1	3.2	0.5		3.3	3.4	1.5	
3.1	3.2	1.0		3.3		2.0	
3.1		1.5		3.3		2.5	
3.1		2.0		3.3		3.0	
3.1		2.5		3.3		3.5	
3.1		3.0					
				3.3	3.7	S	700 m Downstream of I
3.1	5.4	S	Discharge (D)	3.3	3.7	0.5	
3.1	6.1	0.5		3.3	3.7	1.0	
3.1	6.1	1.0		3.3	3.7	1.5	
3.1	6.4	1.5		3.4		2.0	
3.1	6.4	2.0		3.3		2.5	
3.1	6.1	2.5		3.3		3.0	
3.1		3.0		3.3		3.5	
3.1	4.4	S	25 m Downstream of D	3.3	3.6	S	800 m Downstream of I
3.1	4.4	0.5		3.3	3.6	0.5	
3.1	4.4	1.0		3.3	3.6	1.0	
3.1	4.4	1.5		3.3	3.6	1.5	
3.1		2.0		3.3		2.0	
3.1		2.5		3.3		2.5	
3.1		3.0		3.3		3.0	
3.1		3.5		3.3		3.5	
3.2	4.3	S	50 m Downstream of D	3.3	3.5	S	1000 m Downstream of I
3.2	4.4	0.5		3.3	3.5	0.5	
3.1	4.3	1.0		3.3	3.5	1.0	
3.1		1.5		3.3	3.5	1.5	
3.1		2.0		3.3		2.0	
3.1		2.5		3.3		2.5	
3.1		3.0		3.3		3.0	
3.1		3.5		3.3		3.5	
3.1	4.2	S	100 m Downstream of D				
3.1	4.2	0.5					
3.1	4.2	1.0					
3.1		1.5					
3.1		2.0					
3.1		2.5					
3.1		3.0					
3.1		3.5					
3.1		4.0					
3.3	4.1	S	200 m Downstream of D				
3.4	4.2	0.5					
3.2	4.2	1.0					
3.2		1.5					
3.2		2.0					
3.2		2.5					
3.2		3.0					
3.2		3.5					

1565 230

POOR ORIGINAL

Table 5.2-13

Thermal plume data for TMINS on 23 February 1976.

Station Operation Level (): 0	Time: 1-15
Nuclear Service Pumps: 1	Intake Temp. (C): 1.9
Secondary Service Pumps: 1	Effluent Temp. (C): 3.4
Decay Heat Pumps: 1	Air Temp. (C): 4.0
Effluent Rate (cfs): 39.0	Wind Speed (mph): 14
River Flow (cfs): 164,000	Wind Dir.: [illegible]

Distance From Three Mile Island Shore				
40 m	20 m	5 m		
1.6			Depth	
1.5	1.6	1.6	S	Unit 1 Intake
1.6	1.6	1.6	0.5 m	
1.6	1.6	1.6	1.0	
1.6	1.6	1.6	1.5	
1.6	1.6	1.6	2.0	
1.6	1.6	1.6	2.5	
1.5	1.6	1.6	3.0	
		1.6	3.5	
		1.6	4.0	
		1.6	4.5	
1.6	1.6	1.6	S	25 m Upstream of Discharge
1.6	1.6	1.6	0.5	
1.6	1.6	1.6	1.0	
1.6	1.6	1.6	1.5	
1.6	1.6		2.0	
1.6	1.6		2.5	
1.6			3.0	
1.6	1.6	1.8	S	Discharge (D)
1.6	1.6	1.7	0.5	
1.6	1.6	1.8	1.0	
1.6	1.6	2.2	1.5	
1.6	1.6	2.3	2.0	
1.6	1.6	2.3	2.5	
1.6			3.0	
1.6	1.6	1.7	S	25 m Downstream of D
1.6	1.6	1.8	0.5	
1.6	1.6	1.8	1.0	
1.6	1.6	1.8	1.5	
1.6	1.6		2.0	
1.6	1.6		2.5	
1.6	1.6		3.0	
1.6	1.6	1.7	S	50 m Downstream of D
1.6	1.6	1.7	0.5	
1.6	1.6	1.7	1.0	
1.6	1.6	1.8	1.5	
1.6	1.6	1.8	2.0	
1.6	1.6		2.5	
1.6	1.6		3.0	
1.6			3.5	
1.6	1.6	1.7	S	100 m Downstream of D
1.6	1.6	1.7	0.5	
1.6	1.6	1.7	1.0	
1.6	1.6	1.7	1.5	
1.6	1.6		2.0	
1.6	1.6		2.5	
1.6	1.6		3.0	

1565 231

Table 5.2-14

Thermal plume data for TMI-1 on 5 March 197[illegible].

Station Operation Level (MWt): [illegible]	Time: 1115
Nuclear Service Pumps: 2	Intake Temp. (°F): 44
Secondary Service Pumps: 1	Effluent Temp. (°F): 45
Decay Heat Pumps: 1	Air Temp. (°F): 20.0
Effluent Rate (cfs): 440.11	Wind Speed (mph): 19
River Flow (cfs): [illegible]	Wind Dir.: [illegible]

Intake (ft from Three Mile Island Pier)				
50 ft	25 ft	5 ft	Depth	
5.8	5.9	6.0	S	Unit 1 Intake
5.8	5.9	5.9	0.5 m	
5.8	5.9	5.9	1.0	
5.8	5.9	5.9	1.5	
5.8	5.9	5.9	2.0	
5.8	5.9	5.9	2.5	
5.8	5.9	5.9	3.0	
5.8	5.9	6.1		25 m Upstream of Discharge
5.8	5.9	6.1	0.5	
5.8	5.9	6.0	1.0	
5.8	5.9		1.5	
5.8	5.9		2.0	
5.8	5.9		2.5	
5.8			3.0	
5.9	5.9	6.2	S	Discharge (D)
5.9	5.9	6.1	0.5	
5.9	5.9	6.2	1.0	
5.9	5.9	6.4	1.5	
5.9	5.9	6.5	2.0	
5.9	5.9		2.5	
5.9			3.0	
5.9	5.9	6.3	S	25 m Downstream of D
5.9	5.9	6.4	0.5	
5.9	5.9		1.0	
5.9	5.9		1.5	
5.9	5.9		2.0	
5.9	5.9		2.5	
5.9			3.0	
5.9	6.0	6.3	S	50 m Downstream o
5.9	6.0	6.4	0.5	
5.9	5.9		1.0	
5.9	5.9		1.5	
5.9	5.9		2.0	
5.9	5.9		2.5	
	5.9		3.0	
5.9	6.0	6.4	S	100 m Downstream of D
5.9	6.0	6.3	0.5	
5.9	5.9	6.3	1.0	
5.9	5.9		1.5	
5.9	5.9		2.0	
5.9	5.9		2.5	
5.9	5.9		3.0	
5.9	6.0	6.3	S	200 m Downstream of D
5.9	5.9	6.2	0.5	
5.9	5.9	6.3	1.0	
5.9	5.9		1.5	
5.9	5.9		2.0	
5.9	5.9		2.5	
	5.9		3.0	
5.9	6.0	6.2	S	400 m Downstream of D
5.9	6.0	6.2	0.5	
5.9	6.0	6.2	1.0	
5.9	6.0		1.5	
5.9	6.0		2.0	
5.9	6.0		2.5	
5.9	6.0		3.0	
6.0	6.0	6.3	S	800 m Downstream of D
5.9	6.0	6.3	0.5	
6.0	6.0	6.3	1.0	
5.9	6.0		1.5	
5.9	6.0		2.0	
5.9	6.0		2.5	
5.9	6.0		3.0	
	6.1	6.3	S	1000 m Downstream of D
	6.0	6.3	0.5	
	6.0	6.3	1.0	
	6.0	6.3	1.5	
	6.0		2.0	
	6.0		2.5	
	6.0		3.0	

Table 5.2-15

Thermal plume data for TMI-1 on 19 March 197[illegible].

Station Operation Level (MWt): [illegible]	Time: 1215
Nuclear Service Pumps: 2	Intake Temp. (°F): [illegible]
Secondary Service Pumps: 2	Effluent Temp. (°F): 47
Decay Heat Pumps: 0	Air Temp. (°F): [illegible]
Effluent Rate (cfs): 440.10	Wind Speed (mph): [illegible]
River Flow (cfs): [illegible]	Wind Dir.: [illegible]

Intake (ft from Three Mile Island Pier)				
50 ft	25 ft	5 ft	Depth	
3.3	3.3	3.4	S	Unit 1 Intake
3.3	3.3	3.4	0.5 m	
3.3	3.3	3.4	1.0	
3.3	3.3	3.4	1.5	
3.3	3.3	3.4	2.0	
	3.3	3.4	2.5	
3.3	3.4	3.6	S	25 m Upstream of Discharge
3.3	3.4	3.6	0.5	
3.3	3.4		1.0	
3.3	3.4		1.5	
3.3			2.0	
3.4	3.5	4.7	S	Discharge (D)
3.4	3.5	4.7	0.5	
3.4	3.5	4.7	1.0	
3.4	3.5	4.7	1.5	
3.4	4.0	4.2	S	25 m Downstream of D
3.4	4.0	4.2	0.5	
3.4	4.0		1.0	
3.4	3.9		1.5	
3.4			2.0	
3.4	3.7	4.3	S	50 m Downstream of D
3.4	3.7	4.1	0.5	
3.4	3.8	4.2	1.0	
3.4	3.8		1.5	
3.4	3.8		2.0	
3.4	3.7	4.1	S	100 m Downstream of D
3.4	3.6	4.1	0.5	
3.4	3.5	4.0	1.0	
3.4	3.5		1.5	
3.4	3.5		2.0	
3.5	3.6	4.1	S	200 m Downstream of D
3.5	3.6	4.1	0.5	
3.4	3.6	4.0	1.0	
3.4	3.6		1.5	
3.4	3.7		2.0	
3.4	3.6	3.9	S	400 m Downstream of D
3.4	3.6	3.9	0.5	
3.4	3.6		1.0	
3.4	3.6		1.5	
3.4			2.0	
3.5	3.6	3.9	S	1900 m Downstream of D
3.5	3.6	3.9	0.5	
3.5	3.6	4.0	1.0	
3.5	3.6		1.5	
3.5	3.7		2.0	
3.5	3.7		2.5	
3.5			3.0	

POOR ORIGINAL

1565 232

Table 5.2-16

Thermal plume data for TMINS on 1 April 1976.

Station Operation Level (%): 0	Time: 1340
Nuclear Service Pumps: 2	Intake Temp. (C): 9.22
Secondary Service Pumps: 0	Effluent Temp. (C): 8.44
Decay Heat Pumps: 1	Air Temp. (C): NA
Effluent Rate (cfs): 33.[illegible]	Wind Speed (mph): 10
River Flow (cfs): 28,6600	Wind Dir.: [illegible]

Distance from Three Mile Island shore				
40 m	20 m	5 m	Depth	
9.7	9.7	9.7	S	Unit 1 Intake
9.7	9.7	9.7	0.5 m	
9.7	9.7	9.7	1.0	
9.7	9.7	9.7	1.5	
9.7	9.7		2.0	
9.7	9.7		2.5	
	9.7		3.0	
9.7	9.8	9.8	S	25 m Upstream of Discharge
9.7	9.8	9.8	0.5	
9.7	9.8		1.0	
9.7	9.7		1.5	
9.7			2.0	
9.8	9.7	9.1	S	Discharge (D)
9.8	9.8	9.1	0.5	
9.8	9.8	9.1	1.0	Depth at Discharge
9.8	9.8	9.1	1.5	Pipe = 1.75 m
9.8		9.1	2.0	
9.8	9.7	9.4	S	25 m Downstream of D
9.8	9.7	9.4	0.5	
9.8	9.7		1.0	
9.8	9.7		1.5	
9.8			2.0	
9.8	9.7	9.5	S	50 m Downstream of D
9.8	9.7		0.5	
9.8	9.8		1.0	
9.8	9.8		1.5	
9.8	9.7		2.0	
9.8			2.5	
9.8	9.7	9.6	S	100 m Downstream of D
9.8	9.7	9.5	0.5	
9.8	9.7		1.0	
9.8	9.7		1.5	
9.8	9.7		2.0	
9.8			2.5	
9.8	9.7	9.6	S	200 m Downstream of D
9.8	9.8	9.6	0.5	
9.8	9.7	9.6	1.0	
9.8	9.7		1.5	
9.8	9.7		2.0	
9.7	9.7	9.7	S	400 m Downstream of D
9.7	9.7	9.7	0.5	
9.7	9.7		1.0	
9.7	9.7		1.5	
9.7			2.0	
9.7			2.5	
9.7	9.7	9.8	S	1900 m Downstream of D
9.6	9.7	9.8	0.5	
9.7	9.7	9.8	1.0	
9.7	9.7		1.5	
9.7	9.7		2.0	
9.7	9.7		2.5	

Table 5.2-17

Thermal plume data for TMINS on 15 April 1976.

Station Operation Level (%): 0	Time: 1335
Nuclear Service Pumps: 2	Intake Temp. (C): 11.4
Secondary Service Pumps: 1	Effluent Temp. (C): 11.4
Decay Heat Pumps: 0	Air Temp. (C): 21.0
Effluent Rate (cfs): 24.51	Wind Speed (mph): 10
River Flow (cfs): 28,500	Wind Dir.: S

Distance from Three Mile Island Shore				
40 m	20 m	5 m	Depth	
11.8	11.8	11.8	S	Unit 1 Intake
11.8	11.8	11.8	0.5 m	
11.8	11.8	11.8	1.0	
11.8	11.8	11.8	1.5	
11.8	11.8	11.8	2.0	
11.8		11.8	2.5	
		11.8	3.0	
11.9	11.8	11.9	S	25 m Upstream of Discharge
11.9	11.8	11.9	0.5	
11.8	11.8	11.9	1.0	
11.8	11.8		1.5	
11.8	11.8		2.0	
11.9	11.9	11.6	S	Discharge (D)
11.9	11.9	11.6	0.5	
11.9	11.9	11.6	1.0	
11.9	11.9	11.7	1.5	
11.8			2.0	
11.9	11.9	11.7	S	25 m Downstream of D
11.9	11.9	11.7	0.5	
11.9	11.9	11.7	1.0	
11.9	11.9		1.5	
11.9	11.9		2.0	
11.9	11.9	11.8	S	50 m Downstream of D
11.9	11.9	11.8	0.5	
11.9	11.9	11.7	1.0	
11.9	11.9		1.5	
11.9	11.9		2.0	
11.9	11.9	11.9	S	100 m Downstream of D
11.9	11.9	11.9	0.5	
11.9	11.9	11.8	1.0	
11.9	11.9		1.5	
11.9	11.9		2.0	
11.7	11.7	11.8	S	1900 m Downstream of D
11.7	11.7	11.8	0.5	
11.7	11.7	11.8	1.0	
11.7	11.7	11.8	1.5	
11.7	11.7		2.0	
11.7			2.5	
11.7			3.0	

POOR ORIGINAL

1565 233

POOR ORIGINAL

Table 5.2-18

Thermal plume data for TMINS on 29 April 1976.

Station Operation Level (%):	Time: 1440
Nuclear Service Pumps: 2	Intake Temp. (C): 12.3
Secondary Service Pumps: 1	Effluent Temp. (C): 12.2
Decay Heat Pumps: 1	Air Temp. (C): 15.0
Effluent Rate (cfs): 44.06	Wind Speed (mph): 10
River Flow (cfs): 17,[illegible]	Wind Dir.: SW

Distance from Three Mile Island Shore				
40 m	20 m	5 m	Depth	
12.6	12.7	12.8	S	Unit 1 Intake
12.6	12.7	12.8	0.5 m	
12.6	12.6	12.8	1.0	
12.6	12.6	12.8	1.5	
12.6	12.6	12.8	2.0	
12.6	12.6	12.8	2.5	
		12.8	3.0	
12.7	12.7	13.4	S	25 m Upstream of Discharge
12.7	12.7	13.4	0.5	
12.7	12.7		1.0	
12.7	12.7		1.5	
12.7	12.7		2.0	
12.7	12.8	12.2	S	Discharge (D)
12.7	12.8	12.2	0.5	
12.7	12.8	12.2	1.0	
12.7	12.7		1.5	
12.7			2.0	
12.7	12.8	12.4	S	25 m Downstream of D
12.7	12.7	12.4	0.5	
12.7	12.7		1.0	
12.7	12.7		1.5	
12.7	12.7		2.0	
12.7	12.7	12.5	S	50 m Downstream of D
12.7	12.7	12.5	0.5	
12.7	12.7	12.5	1.0	
12.7	12.7		1.5	
12.7	12.7		2.0	
12.7	12.8	12.6	S	100 m Downstream of D
12.7	12.8	12.6	0.5	
12.7	12.7		1.0	
12.7	12.7		1.5	
12.7	12.7		2.0	
12.7	12.8	12.7	S	200 m Downstream of D
12.7	12.8	12.7	0.5	
12.7	12.8	12.7	1.0	
12.7	12.8		1.5	
12.7	12.7		2.0	
12.7	12.8	12.8	S	400 m Downstream of D
12.7	12.8	12.9	0.5	
12.7	12.8		1.0	
12.7	12.8		1.5	
12.7	12.8		2.0	
12.7			2.5	

Table 5.2-19

Thermal plume data for TMINS on 13 May 1976.

Station Operation Level (%): 0	Time: 1306
Nuclear Service Pumps: 2	Intake Temp. (C): 17.4
Secondary Service Pumps: 1	Effluent Temp. (C): 17.2
Decay Heat Pumps: 2	Air Temp. (C): 19.5
Effluent Rate (cfs): 77,97	Wind Speed (mph): 5
River Flow (cfs): 20,400	Wind Dir.: S

Distance from Three Mile Island Shore				
40 m	20 m	5 m	Depth	
17.0	17.2	17.5	S	Unit 1 Intake
17.0	17.2	17.5	0.5 m	
17.0	17.1	17.5	1.0	
17.0	17.1	17.5	1.5	
17.0	17.1	17.4	2.0	
		17.3	2.5	
		17.4	3.0	
17.4	17.5	17.9	S	25 m Upstream of Discharge
17.4	17.4	17.7	0.5	
17.4	17.4	17.6	1.0	
17.4	17.4		1.5	
17.3	17.4		2.0	
17.4	17.5	17.2	S	Discharge (D)
17.3	17.5	17.2	0.5	
17.2	17.5	17.2	1.0	
17.2	17.5	17.2	1.5	
17.2			2.0	
17.4	17.4	17.4	S	25 m Downstream of D
17.4	17.4	17.4	0.5	
17.4	17.4	17.4	1.0	
17.4	17.4		1.5	
17.4	17.4	17.4	S	50 m Downstream of D
17.4	17.4	17.4	0.5	
17.4	17.4	17.3	1.0	
17.4	17.4		1.5	
17.4	17.4		2.0	
17.4	17.4	17.4	S	100 m Downstream of D
17.4	17.4	17.4	0.5	
17.3	17.4	17.4	1.0	
17.3	17.4		1.5	
	17.4		2.0	
17.4	17.4	17.4	S	200 m Downstream of D
17.4	17.4	17.4	0.5	
17.4	17.4	17.4	1.0	
17.4	17.4		1.5	
17.4	17.4		2.0	
17.4	17.5	17.6	S	400 m Downstream of D
17.4	17.5	17.6	0.5	
17.4	17.5		1.0	
17.3	17.4		1.5	
17.3			2.0	
17.2	17.4	17.4	S	1900 m Downstream of D
17.2	17.4	17.4	0.5	
17.1	17.4	17.4	1.0	
17.0	17.3	17.3	1.5	
17.0	17.1		2.0	

1565 234

POOR ORIGINAL

Table 5.2-20

Thermal Plume data for TMINS on 27 May 1976.

Station Operation Level (%): 40 Time: 1310
Nuclear Service Pump.: 2 Intake Temp. (C): 15.7
Secondary Service Pumps: 1 Effluent Temp. (C): 15.0
Decay Heat Pumps: 1 Air Temp. (C): 21.0
Effluent Rate (cfs): 93.57 Wind Speed (mph): 4
River Flow (cfs): 35,000 Wind Dir.: NW

Distance From Three Mile Island Shore				
40 m	20 m	5 m	Depth	
15.1	15.3	15.3	S	Unit 1 Intake
15.1	15.3	15.3	0.5 m	
15.1	15.2	15.3	1.0	
15.1	15.2	15.3	1.5	
15.1	15.2	15.2	2.0	
15.2	15.3	15.7	S	25 m Upstream of Discharge
15.2	15.3	15.6	0.5	
15.2	15.3		1.0	
15.2			1.5	
15.2			2.0	
15.4	15.5	15.4	S	Discharge (D)
15.4	15.4	15.4	0.5	
15.3	15.4	15.4	1.0	
15.3	15.4	15.4	1.5	
15.3			2.0	
15.4	15.5	15.5	S	25 m Downstream of D
15.4	15.5	15.5	0.5	
15.4	15.5	15.5	1.0	
15.4	15.5		1.5	
15.4			2.0	
15.3	15.4	15.6	S	50 m Downstream of D
15.3	15.4	15.5	0.5	
15.3	15.4	15.3	1.0	
15.3	15.4		1.5	
15.3	15.4		2.0	
15.3	15.5	15.6	S	100 m Downstream of D
15.3	15.5	15.5	0.5	
15.3	15.5	15.5	1.0	
15.3	15.5	15.5	1.5	
15.3	15.4		2.0	
15.4	15.5	15.8	S	200 m Downstream of D
15.4	15.5	15.7	0.5	
15.4	15.5		1.0	
15.4	15.5		1.5	
15.4	15.5		2.0	
15.3	15.6	15.8	S	400 m Downstream of D
15.3	15.6	15.8	0.5	
15.3	15.5		1.0	
15.3	15.5		1.5	
15.3	15.5		2.0	
15.3			2.5	
15.4	15.7	15.9	S	1900 m Downstream of D
15.4	15.7	15.8	0.5	
15.4	15.6		1.0	
15.3	15.5		1.5	
15.3	15.4		2.0	
15.3	15.3		2.5	

Table 5.2-21

Thermal plume data for TMINS on 2 June 1976.

Station Operation Level (%): 100 Time: 1320
Nuclear Service Pumps: 1 Intake Temp. (C): 20.56
Secondary Service Pumps: 2 Effluent Temp. (C): 17.78
Decay Heat Pumps: 0 Air Temp. (C): 16.0
Effluent Rate (cfs): 40,10 Wind Speed (mph): Calm
River Flow (cfs): 37,700 Wind Dir.:

Distance From Three Mile Island Shore				
40 m	20 m	5 m	Depth	
19.0	18.9	18.9	S	Unit 1 Intake
19.0	18.9	18.9	0.5 m	
19.0	18.9	18.9	1.0	
19.0	18.9	18.9	1.5	
19.0	18.9	18.9	2.0	
19.0	18.9	19.0	2.5	
19.0		19.0	3.0	
18.9	18.9	18.9	S	25 m Upstream of Discharge
18.9	18.9	18.9	0.5	
18.9	18.9	18.9	1.0	
18.9	18.9		1.5	
18.9	18.9		2.0	
18.9			2.5	
18.9			3.0	
18.9	18.9	18.3	S	Discharge (D)
18.9	18.9	18.3	0.5	
18.9	18.9	18.3	1.0	
18.9	18.9		1.5	
18.9	18.9		2.0	
18.9	18.9	18.4	S	25 m Downstream of D
18.9	18.9	18.4	0.5	
18.9	18.9	18.4	1.0	
18.9	18.9		1.5	
18.9	18.9		2.0	
18.9	18.9	18.5	S	50 m Downstream of D
18.9	18.9	18.5	0.5	
18.9	18.9	18.5	1.0	
18.9	18.9		1.5	
18.9	18.9		2.0	
18.9	18.9	18.6	S	100 m Downstream of D
18.9	18.9	18.6	0.5	
18.9	18.9	18.6	1.0	
18.9	18.9		1.5	
18.9	18.9		2.0	
18.9	18.9	18.6	S	200 m Downstream of D
18.9	18.9	18.6	0.5	
18.9	18.9	18.6	1.0	
18.9	18.9		1.5	
18.9	18.9		2.0	
18.9	18.9	18.7	S	400 m Downstream of D
18.9	18.9	18.7	0.5	
18.9	18.9		1.0	
18.9	18.9		1.5	
18.9	18.9		2.0	
18.9			2.5	
18.9			3.0	
19.0	19.0	18.9	S	1900 m Downstream of D
19.0	19.0	18.9	0.5	
19.0	19.0	18.9	1.0	
19.0	19.0		1.5	
19.0	19.0		2.0	
19.0	18.9		2.5	

1565 235

POOR ORIGINAL

Table 5.2-22

Thermal plume data for TMINS on 14 June 1976.

Station Operation Level (%): 100 Time: 1300
Nuclear Service Pumps: 2 Intake Temp. (°C): 26.0
Secondary Service Pumps: 2 Effluent Temp. (°C): 28.67
Circ. Heat Pumps: 1 Air Temp. (°C): 30.0
Effluent Rate (cfs): 440 10 Wind Speed (mph): 3

Distance from Three Mile Island (ft)				
40 m	20 m	5 m	Depth	
25.7	25.6	25.6	S	Unit 1 Intake
25.7	25.6	25.6	0.5 m	
25.7	25.6	25.6	1.0	
25.7	25.7	25.6	1.5	
	25.7	25.6	2.0	
25.6	25.6	26.2	S	25 m Upstream of Discharge
25.6	25.6	26.2	0.5	
25.6	25.6		1.0	
25.6	25.6		1.5	
25.7			2.0	
25.6	25.7	25.5	S	Discharge (D)
25.6	25.6	25.4	0.5	
25.6	25.6	25.3	1.0	
25.6	25.6		1.5	
25.6			2.0	
25.6	25.9	25.6	S	25 m Downstream of D
25.6	25.6	25.5	0.5	
25.6	25.6	25.5	1.0	
25.6	25.6		1.5	
25.6			2.0	
25.6	25.9	25.7	S	50 m Downstream of D
25.6	25.9	25.7	0.5	
25.6	25.9		1.0	
25.6	25.6		1.5	
25.6	25.6		2.0	
25.9	25.9	25.9	S	100 m Downstream of D
25.9	25.9	25.9	0.5	
25.6	25.9		1.0	
25.6	25.6		1.5	
25.6	25.6		2.0	
25.9	25.9	25.9	S	200 m Downstream of D
25.9	25.9	25.9	0.5	
25.9	25.9	25.9	1.0	
25.9	25.9		1.5	
	25.9		2.0	
25.9	25.9	26.2	S	400 m Downstream of D
25.9	25.9	26.1	0.5	
25.9	25.9	26.1	1.0	
25.9	25.9		1.5	
25.9	25.9		2.0	
25.9			2.5	
26.4	26.4	26.1	S	1900 m Downstream of D
26.0	26.3	26.0	0.5	
25.9	26.1	25.9	1.0	
25.8	25.9	25.8	1.5	
25.8	25.8		2.0	
23.2			2.5	

Table 5.2-23

Thermal plume data for TMINS on 14 June 1976.

Station Operation Level (%): 100 Time: 1355
Nuclear Service Pumps: 2 Intake Temp. (°C): 25.33
Secondary Service Pumps: 2 Effluent Temp. (°C): 28.78
Circ. Heat Pumps: 1 Air Temp. (°C): 29.4
Effluent Rate (cfs): 440 10 Wind Speed (mph): 4

Distance from Three Mile Island (ft)				
40 m	20 m	5 m	Depth	
22.9	22.9	23.0	S	Unit 1 Intake
22.9	22.9	23.0	0.5 m	
22.9	22.9	23.	1.0	
22.9	22.9	23.0	1.5	
22.9	22.9	23.0	2.0	
22.9	22.9	23.	2.5	
		23.	3.0	
22.9	22.9	23.2	S	25 m Upstream of Discharge
22.9	22.9	23.3	0.5	
22.9	22.9		1.0	
22.9	22.9		1.5	
22.9	22.9		2.0	
22.9	22.9		2.5	
23.	23.0	23.3	S	Discharge (D)
23.	23.0	23.3	0.5	
23.0	23.0	23.3	1.0	
23.	23.0	23.4	1.5	
23.0	23.0	23.4	2.0	
23.0	23.0	23.4	S	25 m Downstream of D
23.0	23.0	23.4	0.5	
23.0	23.0		1.0	
23.0	23.0		1.5	
23.0	22.9		2.0	
23.0	22.9		2.5	
22.9	23.0	23.5	S	50 m Downstream of D
22.9	23.0	23.5	0.5	
22.9	23.0		1.0	
22.9	23.0		1.5	
22.9	23.0		2.0	
22.9	23.0		2.5	
23.0	23.1	23.4	S	100 m Downstream of D
23.0	23.1	23.4	0.5	
23.0	23.1	23.3	1.0	
23.0	23.0		1.5	
23.0	23.0		2.0	
23.0	23.0		2.5	
23.0	23.0	23.3	S	200 m Downstream of D
23.0	23.0	23.3	0.5	
23.0	23.0	23.3	1.0	
23.0	23.0		1.5	
23.0	23.0		2.0	
23.0	23.0		2.5	
23.0	23.0	23.2	S	400 m Downstream of D
23.0	23.0	23.2	0.5	
23.0	23.0	23.2	1.0	
23.0	23.0		1.5	
23.0			2.0	
23.0			2.5	
23.2	23.2	23.3	S	1900 m Downstream of D
23.2	23.2	23.3	0.5	
23.2	23.2	23.3	1.0	
23.2	23.2	23.3	1.5	
23.1	23.2		2.0	
23.1	23.1		2.5	

1565 236

POOR ORIGINAL

Table 5.2-24

Thermal plume data for TMINS on 15 July 1976.

Station Operation Level (%): 100		Time: 0930	
Nuclear Service Pumps: 3		Intake Temp. (C): 22.78	
Secondary Service Pumps: 2		Effluent Temp. (C): 23.33	
Decay Heat Pumps: 1		Air Temp. (C) 24.5	
Effluent Rate (cfs): 40.10		Wind Speed (mph): 2-3	
River Flow (cfs): 19,400		Wind Dir. S	

Distance from Three Mile Island shore				
40 m	20 m	5 m	Depth	
22.0	21.9	21.8	S	Unit 1 Intake
22.0	21.9	21.8	0.5 m	
22.0	21.9	21.8	1.0	
22.0	21.9	21.9	1.5	
22.0	21.9	21.8	2.0	
21.9	21.9	21.8	S	25 m Upstream of Discharge
21.9	21.9	21.8	0.5	
21.9	21.8	21.8	1.0	
21.9	21.8		1.5	
21.9	21.8		2.0	
21.9			2.5	
21.9			3.0	
21.9	21.7	22.3	S	Discharge (D)
21.9	21.8	22.2	0.5	
21.9	21.8	22.2	1.0	
21.9	21.8		1.5	
21.9			2.0	
21.9	22.0	22.2	S	25 m Downstream of D
21.9	22.0	22.3	0.5	
21.9	22.0		1.0	
21.9	22.0		1.5	
21.9	22.0		2.0	
22.1	22.0	22.2	S	50 m Downstream of D
22.1	22.0	22.2	0.5	
22.1	22.0	22.1	1.0	
22.0	22.0		1.5	
22.0	21.9		2.0	
22.1	22.0	22.2	S	100 m Downstream of D
22.1	22.0	22.2	0.5	
22.1	22.0		1.0	
22.1	22.0		1.5	
22.0	22.0		2.0	
22.1	22.1	22.1	S	200 m Downstream of D
22.1	22.0	22.1	0.5	
22.1	22.0	22.0	1.0	
22.1	22.0	22.0	1.5	
22.1	22.0		2.0	
22.1	22.0	22.0	S	400 m Downstream of D
22.1	22.0	22.0	0.5	
22.1	22.0	22.0	1.0	
22.1	22.0		1.5	
22.1	22.0		2.0	
22.1			2.5	
21.9	21.9	21.8	S	1900 m Downstream of D
21.9	21.9	21.8	0.5	
21.9	21.9	21.8	1.0	
21.9	21.9	21.8	1.5	
21.8	21.8	21.7	2.0	
21.8	21.7		2.5	
21.7			3.0	

Table 5.2-25

Thermal plume data for TMINS on 30 July 1976.

Station Operation Level (%): 100		Time: 1330	
Nuclear Service Pumps: 3		Intake Temp. (C): 25.0	
Secondary Service Pumps: 2		Effluent Temp. (C): 25.0	
Decay Heat Pumps: 0		Air Temp. (C) 27.0	
Effluent Rate (cfs): 44.66		Wind Speed (mph): 5-7	
River Flow (cfs): 11,200		Wind Dir. S	

Distance from Three Mile Island Shore				
40 m	20 m	5 m	Depth	
23.0	23.6	23.8	S	Unit 1 Intake
22.9	23.5	23.9	0.5 m	
22.9	23.5	23.9	1.0	
22.9	23.5	23.9	1.5	
22.9		23.8	2.0	
		23.7	2.5	
		23.7	3.0	
23.2	23.8	24.0	S	25 m Upstream of Discharge
23.2	23.8	24.0	0.5	
23.1	23.8	24.0	1.0	
23.1	23.8		1.5	
23.1			2.0	
23.5	23.8	24.4	S	Discharge (D)
23.5	23.9	24.4	0.5	
23.5	23.9		1.0	Depth at Discharge
23.4	23.9		1.5	Pipe = 0.75 m
23.4			2.0	
23.2	23.7	24.2	S	25 m Downstream of D
23.2	23.8	24.2	0.5	
23.2	23.8		1.0	
23.1	23.8		1.5	
23.5	24.1	24.1	S	50 m Downstream of D
23.5	24.1	24.1	0.5	
23.5	24.1		1.0	
23.5	24.1		1.5	
23.3	24.0	24.1	S	100 m Downstream of D
23.3	24.0	24.1	0.5	
23.3	24.0	24.1	1.0	
23.3	23.9		1.5	
23.5	23.9	24.2	S	200 m Downstream of D
23.5	23.9	24.2	0.5	
23.5	23.9	24.2	1.0	
23.4	23.9		1.5	
23.4	23.9	24.2	S	400 m Downstream of D
23.3	23.9	24.2	0.5	
23.3	23.9	24.2	1.0	
23.2	23.9		1.5	
23.2	23.9		2.0	
23.9	24.1	24.1	S	1900 m Downstream of D
23.8	23.9	23.9	0.5	
23.7	23.8	23.8	1.0	
23.7	23.8	23.8	1.5	
23.6	23.7		2.0	

1565 237

Table 5.2-26

Thermal plume data for TMI2 on 12 August 1976.

Station Operation Level (%): 100		Time: 1450	
Nuclear Service Pumps: 3		Intake Temp. (C): 25.44	
Secondary Service Pumps: 2		Effluent Temp. (C): 33.3	
Decay Heat Pumps: 0		Air Temp. (C): 26.5	
Effluent Rate (cfs): 26.73		Wind Speed (mph): 5	
River Flow (cfs): 39,200		Wind Dir.: S	

Distance from Three Mile Island Shore				
40 m	20 m	5 m	Depth	
24.6	24.7	24.8	S	Unit 1 Intake
24.6	24.7	24.8	0.5 m	
24.6	24.7	24.8	1.0	
24.6	24.7	24.8	1.5	
24.6	24.7	24.8	2.0	
		24.8	2.5	
		24.8	3.0	
24.7	24.8	25.1	S	25 m Upstream of Discharge
24.7	24.8	25.1	0.5	
24.7	24.8		1.0	
24.7	24.8		1.5	
24.7	24.8		2.0	
24.8	24.9	24.7	S	Discharge (D)
24.8	24.9	24.7	0.5	
24.8	24.9	24.7	1.0	Depth at Discharge
24.8	24.9	24.7	1.5	Pipe = 1.5 m
24.8	24.9	24.8	S	25 m Downstream of D
24.8	24.9	24.8	0.5	
24.8	24.9		1.0	
24.8	24.9		1.5	
24.8			2.0	
24.8	24.9	24.9	S	50 m Downstream of D
24.8	24.9		0.5	
24.8	24.9		1.0	
24.8	24.9		1.5	
24.8			2.0	
24.8	24.8	24.8	S	100 m Downstream of D
24.8	24.8	24.8	0.5	
24.7	24.8	24.8	1.0	
24.7	24.8		1.5	
24.7	24.8		2.0	
24.8	24.9	24.9	S	200 m Downstream of D
24.8	24.9	24.9	0.5	
24.8	24.9	24.9	1.0	
24.8	24.8		1.5	
24.8	24.8		2.0	
24.9	24.9	25.1	S	400 m Downstream of D
24.9	24.9	25.1	0.5	
24.9	24.9		1.0	
24.8	24.9		1.5	
24.8			2.0	
24.9	24.9	25.2	S	1900 m Downstream of D
24.9	24.9	25.2	0.5	
24.9	24.9	25.1	1.0	
24.8	24.8	25.1	1.5	
24.8	24.8		2.0	
24.6			2.5	

Table 5.2-27

Thermal plume data for TMI#5 on 26 August 1976.

Station Operation Level (%): 100		Time: 1325	
Nuclear Service Pumps: 3		Intake Temp. (C): 26.67	
Secondary Service Pumps: 2		Effluent Temp. (C): 35.83	
Decay Heat Pumps: 0		Air Temp. (C): 29.0	
Effluent Rate (cfs): 53.47		Wind Speed (mph): 4	
River Flow (cfs): 11,600		Wind Dir.: W	

Distance from Three Mile Island Shore				
40 m	20 m	5 m	Depth	
26.6	26.4	26.2	S	Unit 1 Intake
26.6	26.4	26.2	0.5 m	
26.6	26.4	26.2	1.0	
26.6	26.4	26.1	1.5	
	26.3	26.1	2.0	
	26.3	26.1	2.5	
26.4	26.2	27.1	S	25 m Upstream of Discharge
26.4	26.2	26.9	0.5	
26.4	26.1		1.0	
26.4	26.1		1.5	
26.4			2.0	
26.3	26.3	26.0	S	Discharge (D)
26.3	26.3	26.0	0.5	
26.2	26.3	26.0	1.0	Depth at Discharge
26.2			1.5	Pipe = 1.0 m
26.2	26.2	26.9	S	25 m Downstream of D
26.2	26.2	26.9	0.5	
26.2	26.2		1.0	
26.2			1.5	
26.6	26.2	26.3	S	50 m Downstream of D
26.6	26.2	26.3	0.5	
26.5	26.2		1.0	
26.4	26.2		1.5	
26.3	26.3	26.4	S	100 m Downstream of D
26.3	26.2	26.4	0.5	
26.3	26.2		1.0	
26.3	26.2		1.5	
26.4	26.3	26.3	S	200 m Downstream of D
26.4	26.3	26.3	0.5	
26.4	26.3	26.3	1.0	
26.4	26.3		1.5	
26.3	26.3	26.3	S	400 m Downstream of D
26.3	26.3	26.3	0.5	
26.3	26.3		1.0	
26.3	26.3		1.5	
27.0	27.4	28.0	S	1900 m Downstream of D
27.0	27.3	27.7	0.5	
26.9	27.1	27.3	1.0	
26.9	27.0	27.0	1.5	
26.4	26.5		2.0	

POOR ORIGINAL

Table 5.2-28

Thermal plume data for TMI#5 on 9 September 1976.

Station Operation Level (%): 100			Time: 1310
Nuclear Service Pumps: 3			Intake Temp. (C): 23.72
Secondary Service Pumps: 2			Effluent Temp. (C): 22.50
Decay Heat Pumps: 1			Air Temp. (C): 27.0
Effluent Rate (cfs): 62.38			Wind Speed (mph): 4
River Flow (cfs): 4300			Wind Dir.: S
Distance From Three Mile Island Shore			
40 m	20 m	5 m	Depth
23.0	22.7	22.7	S Unit 1 Intake
23.0	22.7	22.7	0.5 m
23.0	22.7	22.7	1.0
23.0	22.7	22.7	1.5
22.9	22.6	22.7	2.0
		22.6	2.5
		22.6	3.0
23.0	23.2	23.0	S 25 m Upstream of Discharge
22.9	23.0	23.1	0.5
22.9	22.9		1.0
22.8	22.8		1.5
22.7			2.0
23.1	23.0	22.8	S Discharge (D)
23.0	23.0	22.9	0.5
22.9	23.0	23.0	1.0 Depth at Discharge
22.8			1.5 Pipe = 1.0 m
22.9	23.0	23.0	S 25 m Downstream of D
22.9	23.0	22.9	0.5
22.9	23.0		1.0
22.8	23.0		1.5
23.0	23.0	23.0	S 50 m Downstream of D
23.0	23.0	23.0	0.5
23.0	23.0		1.0
23.0	23.0		1.5
23.0	23.0	23.1	S 100 m Downstream of D
22.9	23.0	23.1	0.5
22.9	23.0		1.0
22.9	23.0		1.5
23.0	23.2	23.4	S 200 m Downstream of D
23.0	23.1	23.3	0.5
23.0	23.1		1.0
22.9	23.0		1.5
23.1	23.2	23.3	S 400 m Downstream of D
23.1	23.1	23.4	0.5
23.1	23.1		1.0
23.1	23.1		1.5
23.0			2.0
23.0			2.5
24.0	24.4	24.9	S 1900 m Downstream of D
23.7	23.3	24.3	0.5
23.4	23.1	23.0	1.0
23.1	23.0		1.5
22.9	22.5		2.0

Table 5.2-29

Thermal plume data for TMI#5 on 22 September 1976.

Station Operation Level (%): 100			Time: 1315
Nuclear Service Pumps: 3			Intake Temp. (C): 18.5
Secondary Service Pumps: 2			Effluent Temp. (C): 18.06
Decay Heat Pumps: 0			Air Temp. (C): 14.0
Effluent Rate (cfs): 44.56			Wind Speed (mph): 10
River Flow (cfs): 14,500			Wind Dir.: S
Distance From Three Mile Island Shore			
40 m	20 m	5 m	Depth
18.5	18.3	18.3	S Unit 1 Intake
18.5	18.3	18.3	0.5 m
18.5	18.3	18.3	1.0
18.5	18.3	18.3	1.5
18.5	18.3	18.3	2.0
		18.3	2.5
		18.3	3.0
18.6	18.5	18.6	S 25 m Upstream of Discharge
18.6	18.4	18.7	0.5
18.7	18.4		1.0
18.7	18.4		1.5
18.7	18.4		2.0
18.7			2.5
18.3	18.4	17.4	S Discharge (D)
18.3	18.3	17.4	0.5
18.3	18.3	17.5	1.0 Depth at Discharge
18.3			1.5 Pipe = 1.0 m
18.2	18.0	18.1	S 25 m Downstream of D
18.2	18.0	18.1	0.5
18.2	18.0		1.0
18.3	18.0		1.5
18.3	18.3	17.9	S 50 m Downstream of D
18.4	18.3	18.0	0.5
18.4	18.3		1.0
18.4	18.3		1.5
18.4	18.3	18.2	S 100 m Downstream of D
18.5	18.4	18.2	0.5
18.5	18.4	18.2	1.0
18.5	18.4		1.5
18.4	18.3	18.1	S 200 m Downstream of D
18.4	18.3	18.2	0.5
18.4	18.3	18.2	1.0
18.3	18.2		1.5
18.3	18.4	18.4	S 400 m Downstream of D
18.3	18.4	18.4	0.5
18.3	18.4		1.0
18.3	18.4		1.5
18.3	18.3		2.0
18.4			2.5
18.2	18.2	18.5	S 1900 m Downstream of D
18.3	18.3	18.5	0.5
18.3	18.3	18.5	1.0
18.3	18.3		1.5
18.4			2.0

POOR ORIGINAL

POOR ORIGINAL

Table 5.2-30

Thermal plume data for TMINS on 7 October 1976.

Station Operation Level (%):	100	Time:	1330
Nuclear Service Pumps:	2	Intake Temp. (C):	16.39
Secondary Service Pumps:	2	Effluent Temp. (C):	18.78
Decay Heat Pumps:	0	Air Temp. (C):	19.0
Effluent Rate (cfs):	44.56	Wind Speed (mph):	2
River Flow (cfs):	24,100	Wind Dir.:	W

Distance from Three Mile Island Shore				
40 m	20 m	5 m	Depth	
17.2	17.0	16.5	S	Unit 1 Intake
17.2	17.0	16.5	0.5 m	
17.2	17.0	16.5	1.0	
17.2	17.0	16.5	1.5	
17.2	17.0	16.5	2.0	
17.3	17.0	16.5	2.5	
	17.0	16.5	3.0	
17.1	16.7	16.7	S	25 m Upstream of Discharge
17.1	16.7	16.7	0.5	
17.1	16.7		1.0	
17.1	16.6		1.5	
17.1	16.6		2.0	
17.1			2.5	
17.1			3.0	
17.0	16.6	17.3	S	Discharge (D)
16.9	16.6	17.3	0.5	
16.9	16.6	17.3	1.0	Depth at Discharge
16.9	16.6	17.2	1.5	Pipe = 1.5 m
16.9	16.6		2.0	
17.0	16.7	17.0	S	25 m Downstream of D
17.0	16.7	16.9	0.5	
17.0	16.7		1.0	
17.0	16.7		1.5	
17.1			2.0	
17.1	16.7	16.9	S	50 m Downstream of D
17.1	16.7	16.9	0.5	
17.1	16.7		1.0	
17.1	16.7		1.5	
17.1	16.7		2.0	
17.1	16.7	16.8	S	100 m Downstream of D
17.1	16.7	16.8	0.5	
17.1	16.7		1.0	
17.1	16.7		1.5	
17.1	16.7		2.0	
17.2	16.8	16.8	S	200 m Downstream of D
17.2	16.8	16.8	0.5	
17.2	16.8		1.0	
17.2	16.8		1.5	
17.3	16.8		2.0	
17.2	16.9	16.9	S	400 m Downstream of D
17.2	16.9	16.9	0.5	
17.2	16.9		1.0	
17.2	16.9		1.5	
17.2	16.9		2.0	
17.2	16.9		2.5	
17.0	16.8	16.9	S	1900 m Downstream of D
17.0	16.8	16.9	0.5	
17.0	16.8		1.0	
17.0	16.8		1.5	
17.0	16.8		2.0	
17.0	16.8		2.5	

Table 5.2-31

Thermal plume data for TMINS on 21 October 1976.

Station Operation Level (%):	50	Time:	1336
Nuclear Service Pumps:	2	Intake Temp. (C):	10.22
Secondary Service Pumps:	2	Effluent Temp. (C):	10.67
Decay Heat Pumps:	0	Air Temp. (C):	11.0
Effluent Rate (cfs):	66.84	Wind Speed (mph):	18
River Flow (cfs):	43,600	Wind Dir.:	W

Distance From Three Mile Island Shore				
40 m	20 m	5 m	Depth	
10.3	10.4	10.5	S	Unit 1 Intake
10.3	10.5	10.6	0.5 m	
10.3	10.5	10.6	1.0	
10.3	10.5	10.6	1.5	
10.3	10.5	10.6	2.0	
	10.5	10.5	2.5	
	10.5	10.5	3.0	
10.5	10.6	10.7	S	25 m Upstream of Discharge
10.5	10.6	10.6	0.5	
10.5	10.5		1.0	
10.4	10.5		1.5	
10.4	10.5		2.0	
10.5	10.3	10.2	S	Discharge (D)
10.5	10.4	10.2	0.5	
10.4	10.4	10.2	1.0	Depth at Discharge
10.4	10.4	10.2	1.5	Pipe = 1.5 m
10.4			2.0	
10.5	10.4	10.4	S	25 m Downstream of D
10.5	10.5	10.4	0.5	
10.5	10.5		1.0	
10.5	10.5		1.5	
10.5	10.4		2.0	
10.5	10.5	10.4	S	50 m Downstream of D
10.5	10.5	10.4	0.5	
10.5	10.5	10.4	1.0	
10.5	10.5		1.5	
10.5	10.5		2.0	
10.6	10.5	10.5	S	100 m Downstream of D
10.5	10.5	10.5	0.5	
10.5	10.5		1.0	
10.5	10.5		1.5	
10.5	10.5		2.0	
10.5	10.5	10.5	S	200 m Downstream of D
10.5	10.5	10.5	0.5	
10.5	10.5		1.0	
10.5	10.5		1.5	
10.5	10.5		2.0	
10.5			2.5	
10.5	10.6	10.6	S	400 m Downstream of D
10.5	10.5	10.6	0.5	
10.5	10.5		1.0	
10.5	10.5		1.5	
10.5			2.0	
10.4	10.5	10.5	S	1900 m Downstream of D
10.4	10.5	10.5	0.5	
10.4	10.5	10.5	1.0	
10.4	10.4		1.5	
10.4	10.4		2.0	
10.4			2.5	

1565 240

POOR ORIGINAL

Table 5.2-32

Thermal plume data for TMI-1 on 4 November 1976.

Station Operation Level (%): 100 Time: 1327
Nuclear Service Pumps: 2 Intake Temp (°F): 55.22
Secondary Service Pumps: 2 Effluent Temp (°F): 65.39
Decay Heat Pumps: 0 Air Temp. (°F): 49.0
Effluent Rate (cfs): 449.01 Wind Speed (mph): 3
River Flow (cfs): 72,340 Wind Dir.: W

Distance from Three Mile Island Shore				
40 m	20 m	5 m	Depth	
6.4	6.4	6.5	S	Unit 1 Intake
6.4	6.4	6.5	0.5 m	
6.4	6.4	6.5	1.0	
6.4	6.4	6.5	1.5	
6.4	6.4	6.5	2.0	
6.4	6.4	6.5	2.5	
	6.4	6.5	3.0	
6.4	6.5	6.5	S	25 m Upstream of Discharge
6.4	6.5	6.5	0.5	
6.4	6.5	6.5	1.0	
6.4	6.5		1.5	
6.4	6.5		2.0	
6.4	6.5		2.5	
6.4	6.4	7.1	S	Discharge (D)
6.4	6.4	7.1	0.5	
6.4	6.4	7.1	1.0	Depth at Discharge
6.4	6.4	7.1	1.5	Pipe = 1.75 m
6.4	6.4		2.0	
6.4			2.5	
6.4	6.5	6.9	S	25 m Downstream of D
6.4	6.5	6.9	0.5	
6.4	6.5		1.0	
6.4	6.5		1.5	
6.4	6.5		2.0	
6.4			2.5	
6.4	6.4	6.8	S	50 m Downstream of D
6.4	6.4	6.8	0.5	
6.4	6.4		1.0	
6.4	6.4		1.5	
6.4	6.4		2.0	
6.4	6.4		2.5	
6.4	6.5	6.8	S	100 m Downstream of D
6.4	6.5	6.8	0.5	
6.4	6.5	6.8	1.0	
6.4	6.5		1.5	
6.4	6.5		2.0	
6.4	6.5		2.5	
6.4	6.5	6.8	S	200 m Downstream of D
6.4	6.5	6.8	0.5	
6.4	6.5	6.8	1.0	
6.4	6.5		1.5	
6.4	6.5		2.0	
	6.5		2.5	
6.4	6.5	6.7	S	400 m Downstream of D
6.4	6.5	6.7	0.5	
6.4	6.5		1.0	
6.4	6.5		1.5	
6.4	6.5		2.0	
6.4	6.5		2.5	
6.4			3.0	
6.4	6.5	6.8	S	800 m Downstream of D
6.4	6.5	6.8	0.5	
6.4	6.5	6.8	1.0	
6.4	6.5		1.5	
6.4	6.5		2.0	
6.4	6.5		2.5	
6.4	6.5	6.8	S	1900 m Downstream of D
6.4	6.5	6.8	0.5	
6.4	6.5	6.8	1.0	
6.4	6.5		1.5	
6.4	6.5		2.0	
6.4	6.5		2.5	
6.4	6.5		3.0	

Table 5.2-33

Thermal plume data for TMI-1 on 18 November 1976.

Station Operation Level (%): 0 Time: 0850
Nuclear Service Pumps: 1 Intake Temp. (°F): 2.03
Secondary Service Pumps: 1 Effluent Temp. (°F): 4.--
Decay Heat Pumps: 1 Air Temp. (°F): 1.5
Effluent Rate (cfs): 57.92 Wind Speed (mph): 4
River Flow (cfs): 23,400 Wind Dir.: W

Distance from Three Mile Island Shore				
40 m	20 m	5 m	Depth	
2.7	3.1	3.5	S	Unit 1 Intake
2.6	3.1	3.5	0.5 m	
2.6	3.1	3.5	1.0	
2.6	3.1	3.5	1.5	
	3.2	3.5	2.0	
	3.2	3.5	2.5	
	3.3		3.0	
2.7	3.4	3.5	S	25 m Upstream of Discharge
2.7	3.4	3.5	0.5	
2.7	3.4	3.5	1.0	
2.7	3.4		1.5	
2.7	3.3		2.0	
2.7			2.5	
2.7	3.5	4.3	S	Discharge (D)
2.7	3.5	4.3	0.5	
2.7	3.4	4.3	1.0	Depth at Discharge
2.7	3.4	4.2	1.5	Pipe = 1.5 m
2.7			2.0	
2.6	3.7	3.8	S	25 m Downstream of D
2.6	3.7	3.8	0.5	
2.6	3.7	3.8	1.0	
2.6	3.6		1.5	
2.6	3.5		2.0	
3.1	3.5	3.9	S	50 m Downstream of D
3.1	3.6	3.9	0.5	
3.2	3.6	3.8	1.0	
3.1	3.5		1.5	
3.1	3.5		2.0	
2.8	3.4	3.7	S	100 m Downstream of D
2.8	3.4	3.7	0.5	
2.8	3.4		1.0	
2.8	3.4		1.5	
2.8	3.3		2.0	
2.6	3.1	3.7	S	200 m Downstream of D
2.6	3.1	3.7	0.5	
2.6	3.1		1.0	
2.6	3.1		1.5	
2.6	3.1		2.0	
3.1	3.5	3.7	S	400 m Downstream of D
3.0	3.5	3.7	0.5	
2.9	3.5		1.0	
2.9	3.5		1.5	
2.9	3.5		2.0	
2.8			2.5	
2.9	3.5	3.8	S	1900 m Downstream of D
2.9	3.5	3.8	0.5	
2.9	3.5		1.0	
2.9	3.5		1.5	
2.9	3.5		2.0	
2.9	3.5		2.5	

1565 241

Table 5.2-34

Summary of surface water temperatures (C) at selected plume map stations, discharge and ambient river temperature differences, air temperatures, wind conditions, discharge rate, river flow, and station operation level February through November 1976.

	Feb 1[illegible]	Feb 2[illegible]	Feb 21	Feb [illegible]	Feb [illegible]	Feb [illegible]	Feb [illegible]	Feb [illegible]	Feb [illegible]	Feb [illegible]	Feb [illegible]	Feb [illegible]	[illegible]	Mar [illegible]	Mar 1[illegible]	Apr [illegible]	Apr [illegible]
Ambient River - 5 m offshore at Intake	2.1	2.4	2.2	2.2	2.3	2.6	2.7	2.7	2.8	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	11.8
Discharge - 5 m offshore	4.7	3.0	2.2	2.2	2.6	2.9	3.3	3.1	[illegible]	5.5	7.6	5.8	1.8	[illegible]	[illegible]	[illegible]	11.[illegible]
50 m downstream of Discharge (D) 5 m offshore	2.5	2.7	2.3	2.4	2.4	2.7	3.2	[illegible]	4.2	4.2	[illegible]	[illegible]	1.7	[illegible]	[illegible]	[illegible]	11.8
50 m downstream of D 20 m offshore	2.3	2.4	2.2	2.2	2.2	2.6	2.7	2.7	2.8	2.9	3.3	[illegible]	1.[illegible]	[illegible]	[illegible]	[illegible]	11.[illegible]
100 m downstream of D 5 m offshore	2.7	2.7	2.3	2.3	2.4	2.8	3.0	2.8	4.0	4.1	[illegible]	[illegible]	1.[illegible]	[illegible]	[illegible]	[illegible]	11.[illegible]
100 m downstream of D 20 m offshore	2.0	NA	2.2	2.2	2.2	2.6	2.7	2.7	2.9	3.1	3.1	3.1	1.[illegible]	[illegible]	[illegible]	[illegible]	11.[illegible]
Discharge Temp. minus Ambient River Temp.	2.6	0.6	0.0	0.5	0.3	0.3	0.6	0.4	2.4	2.7	4.6	2.7	0.2	0.2	1.[illegible]	[illegible]	[illegible]
Air Temp. (C)	13.0	8.0	3.0	3.0	8.0	15.0	10.5	15.0	11.0	NA	NA	NA	[illegible]	[illegible]	16.[illegible]	NA	[illegible]
Wind Direction	N	NW	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	S	S		[illegible]	[illegible]	NW	[illegible]	[illegible]	
Wind Speed (mph)	3	6	8	8	10	8	10	9	9	9	10	20	15	19	[illegible]	1[illegible]	1[illegible]
Discharge Rate ($ft^3/sec \times 10^{-3}$)	0.02[illegible]	0.018	0.056	0.065	0.065	0.01[illegible]	0.045	0.065	0.111	0.111	0.116	0.111	[illegible]	0.06[illegible]	[illegible]	[illegible]	[illegible]
River Flow ($ft^3/sec \times 10^{-3}$)	55.6	240.6	229.0	229.0	229.0	219.0	219.0	219.0	209.0	209.0	204.0	1[illegible]	1[illegible]	1[illegible]	[illegible]	[illegible]	[illegible]
Station Operation Level (%)	100	0	0	0	0	0	0	0	0	0	0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Table 5.2-34 continued.

	Apr 29	May 11	May 22	Jun 2	Jun 1[illegible]	Jun 2[illegible]	Jul 15	Jul [illegible]	Aug 12	Aug 26	Sep 9	Sep 22	Oct 7	Oct 21	[illegible]	Nov 1[illegible]
Ambient River - 5 m offshore at Intake	12.8	17.5	15.3	18.9	25.8	23.0	21.8	23.8	25.8	26.2	22.7	18.[illegible]	16.5	10.[illegible]	[illegible]	[illegible]
Discharge - 5 m offshore	12.2	17.2	15.4	18.3	25.5	23.3	22.3	25.4	25.7	26.0	22.8	17.6	17.[illegible]	10.2	[illegible]	[illegible]
50 m downstream of Discharge (D) 5 m offshore	12.5	17.4	15.6	18.5	25.7	23.5	22.2	24.1	24.9	26.1	23.0	17.9	16.9	10.[illegible]	[illegible]	[illegible]
50 m downstream of D 20 m offshore	12.7	17.4	15.4	18.9	25.9	23.0	22.0	24.1	24.9	26.2	23.0	18.[illegible]	16.7	10.5	[illegible]	[illegible]
100 m downstream of D 5 m offshore	12.6	17.4	15.6	18.6	25.9	23.6	22.2	24.1	24.8	26.4	23.1	18.2	16.8	10.5	[illegible]	[illegible]
100 m downstream of D 20 m offshore	12.8	17.4	15.5	18.9	25.9	23.1	22.9	24.0	24.8	26.3	23.0	18.[illegible]	16.7	10.5	6.5	[illegible]
Discharge Temp. minus Ambient River Temp.	-0.6	-0.3	0.1	-0.6	-0.3	0.3	0.5	0.6	-0.1	0.2	0.1	[illegible]	0.8	[illegible]	[illegible]	[illegible]
Air Temp. (C)	18.0	19.5	21.0	16.0	30.0	29.0	26.5	27.0	28.5	29.0	22.0	19.0	18.0	11.0	9.0	1.5
Wind Direction	NW	[illegible]	WNW	E	W	[illegible]	S	W	[illegible]	W	E	[illegible]	NW	W	NW	NW
Wind Speed (mph)	10	5	4	0	1	8	2-3	5-7	5	4	4	10	2	18	3	[illegible]
Discharge Rate ($ft^3/sec \times 10^{-3}$)	0.065	0.078	0.096	0.06	0.06	0.019	0.06	0.065	0.027	0.051	0.06[illegible]	0.065	0.0[illegible]	0.067	[illegible]	0.058
River Flow ($ft^3/sec \times 10^{-3}$)	17.5	20.6	15.0	17.7	25.[illegible]	16.2	19.8	13.5	19.2	11.6	8.[illegible]	16.5	23.1	[illegible]	22.[illegible]	23.[illegible]
Station Operation Level (%)	0	0	60	100	100	100	100	100	100	100	100	100	100	50	100	[illegible]

NA = Not Available.

POOR ORIGINAL

POOR ORIGINAL

6.0 EFFECTS OF COOLING TOWER SALT DRIFT ON AGRICULTURAL CROPS AND NATURAL VEGETATION

The objective of this investigation was to observe changes in the incidence of plant pathogens or insect damages on agricultural crops and natural vegetation that could be attributed to salt drift from the cooling towers at TMINS as required by the ETS, Appendix B, Section 4.1.2.2.

6.1 PLANT PATHOGENS

Plant pathology transects established in 1973 and surveyed in 1974 (Woodward-Envicon, Inc. 1974, 1975) and 1975 (Potter and Associates 1976), were examined monthly from April through October 1976. Location of transects is shown in Figure 6.1-1.

6.1.1 METHODS

Visual examination of agricultural crops and natural vegetation along the transect lines was conducted in the latter half of each month. A list of all plants in flower was kept to determine differences in flowering time or appearance of flowers. All plant diseases and significant damage due to insects were recorded; collections were made when necessary for identification. The "Forest Insect and Disease Management Manual" (Pennsylvania Department of Environmental Resources 1975) was used for identification of plant diseases; nomenclature of vascular plants followed Gleason and Cronquist (1963).

1565 243

POOR ORIGINAL

6.1.2 RESULTS

In 1976, 219 species of flowering plants were observed (Table 6.1-1). This represented three species more than in 1975. However, 41 species observed in 1975 were not seen in 1976, and 44 species were found in flower in 1976 which were not observed in 1975. The major difference occurred in April and May; 29 (66%) of the new species in 1976 were observed in these months. The spring of 1976 was umusually mild and many species were observed a month earlier than in 1975. Most species were observed at the same locations as in 1975. Differences were related to habitat or were random with respect to TMINS.

Four parasitic diseases were observed on agricultural crops (Table 6.1-2); none caused significant damage. Plant parasitic diseases were observed on 21 taxa (Table 6.1-3). Five diseases observed in 1975 were not seen in 1976, and one disease was observed for the first time in 1976. The total number of parasitic diseases was 19 in 1973, 26 in 1974, 19 in 1975, and 14 in 1976. Powdery mildews were more prominent in 1976 than in 1975; this was probably the result of prolonged high humidity in late summer (Pennsylvania Department of Environmental Resources 1975). Many diseases occurred at the same localities as in 1975; where differences occurred they were related to the presence of host plants and no pattern was observed with respect to the location of TMINS. Vegetation with significant insect damage is listed in Table 6.1-4. Some defoliation was caused by fall webworm on several species, and by Japanese beetle on elm. Other damage was less extensive. No pattern was observed relative to the location of TMINS.

1565 244

POOR ORIGINAL

6.1.3 OTHER VEGETATION DISTURBANCES

Other disturbances to vegetation, both natural and caused by man, were less noticeable in 1976 than in 1975. Several narrow corridors cut through the south woodlot on Three Mile Island were first observed in April 1976. Except for the cut trees, the effects had largely disappeared by mid-summer. Much less disturbance was observed on Shelley Island in 1976, and some of the areas cleared in 1975 were allowed to revegetate in 1976.

Gleason, H.A. and A. Cronquist. 1963. Manual of Vascular Plants of Northeastern United States and Adjacent Canada. D. Van Nostrand Company, Princeton, N.J. 810 pp.

Pennsylvania Department of Environmental Resources. 1975. Forest Insect and Disease Management Manual. Bureau of Forestry, Division of Pest Management, Middletown, Pennsylvania. 658 pp.

Potter, W.A. and Associates. 1976. An ecological study of the Susquehanna River in the vicinity of the Three Mile Island Nuclear Station. Annual Report for 1975. Ichthyological Associates, Inc. 395 pp.

Woodward-Envicon, Inc. 1974. Three Mile Island Nuclear Station, Units 1 and 2. Terrestrial Environmental Studies. Pre-operational Survey. 330 pp.

Woodward-Envicon, Inc. 1975. Three Mile Island Nuclear Station, Units 1 and 2. Terrestrial Environmental Studies. Post-operational Survey. 53 pp.

1565 245

POOR ORIGINAL

Table 6.1-1

Plants observed in flower in salt drift transects[1] in the vicinity of TMINS in 1976.

Taxon[2]	Common Name	Month observed[3]			
		TMI	Shelley Is	RT 262	East Side
Gramineae					
Agrostis sp.	bentgrass	5	5	-	5
Anthoxanthum odoratum	sweet vernal grass	-	4	-	-
Bromus secalinus	chess	-	-	5	5
Dactylis glomerata	orchard grass	-	5	5,6	5
Glyceria melicaria	glyceria	5	-	-	-
Phleum pratense	timothy	-	-	6	5,6
Poa annua	annual bluegrass	-	4	5	4,5
Poa sp.	bluegrass	5	5	5	5
Tridia flava	purpletop	-	-	9	9
Cyperaceae					
Carex lurida	sedge	-	-	-	6
Carex spp.	sedge	4	4	-	4
Araceae					
Arisaema triphyllum	Jack-in-the-pulpit	-	4	-	-
Commelinaceae					
Commelina communis	dayflower	7,8	7,8	-	7,8,9
Liliaceae					
Asparagus officinalis	asparagus	-	-	5	5
Erythronium americanum	dog-tooth violet	-	4	-	4
Hemerocallus fulva	day lily	-	6	6	6
Muscari botryoides	grape hyacinth	-	-	4	4
Polygonatum biflorum	Solomon's seal	-	5	-	-
Smilacena racemosa	false Solomon's seal	-	-	-	5
Yucca filamentosa	Spanish bayonet	-	-	-	6
Amaryllidaceae					
Narcissus pseudonarcissus	datfodil	-	-	4	-
Betulaceae					
Betula nigra	river birch	4	4	-	4
Fagaceae					
Quercus bicolor	swamp white oak	-	-	-	4
Quercus borealis	red oak	-	-	-	4
Quercus palustris	pin oak	-	-	4	4
Ulmaceae					
Celtis occidentalis	hackberry	-	-	4	4
Urticaceae					
Boehmeria cylindrica	false nettle	6	7	-	-
Pilea pumila	clearweed	7,8	7,8	-	-
Urtica dioica	stinging nettle	6,7	6,7	-	-

1565 246

Table 6.1-1 continued.

Taxon	Common Name	Month Observed			
		TMI	Shelley Is	RT 262	East Side
Polygonaceae					
Polygonum caespitosum	smartweed	6,7,9,10	7,9,10	9,10	9,10
Polygonum cuspidatum	Mexican bamboo	-	-	-	7,8
Polygonum hydropiperoides	smartweed	8,9,10	8,9,10	8,9	9,10
Polygonum pensylvanicum	smartweed	9	8	8,9	8,9,10
Polygonum persicaria	smartweed	6,7,8	6,7,8	6	6
Polygonum sagittatum	tear-thumb	-	-	9	9
Polygonum scandens	false buckwheat	6,7	6,7,8	-	7,8
Polygonum virginianum	Virginia knotweed	7,8	7,8	-	7
Rumex acetosella	sheep sorrel	-	-	5	4,5
Rumex altissimus	water dock		5	5	5
Phytolaccaceae					
Phytolacca americana	pokeweed	6-9	6,7,8	7,8,9	6-9
Portulaccaceae					
Claytonia virginica	spring beauty	4	4	4	4
Caryophyllaceae					
Agrostemma githago	corn cockle	-	-	-	5
Dianthus armeria	deptford pink	-	-	-	6
Lychnis alba	white campion	-	-	-	4,5,6,9,10
Saponaria officinalis	bouncing bet	-	-	7,8,9	6-9
Silene antirrhina	sleepy catchfly	-	-	-	5
Silene cucubalis	bladder campion	-	-	-	5,6,7
Silene nivea	snowy campion	-	6	-	-
Stellaria media	common chickweed	4	4	4	4
Magnoliaceae					
Liriodendron tulipifera	tulip tree	-	5	-	5
Annonaceae					
Asimina triloba	pawpaw	-	4	-	-
Ranunculaceae					
Aquilegia canadensis	columbine	-	-	4	-
Ranunculus abortivus	small-flowered buttercup	-	4	4	4
Ranunculus acris	buttercup	-	-	-	5
Thalictrum polygamum	tall meadow-rue	-	6	-	-
Berberidaceae					
Berberis thunbergii	barberry	-	-	-	4
Podophyllum peltatum	may apple	-	4	-	-
Lauraceae					
Lindera benzoin	spicebush	-	4	-	-
Sassafras albidum	sassafras	-	4	-	4
Papaveraceae					
Chelidonium majus	celandine	-	5	4,5,6	4,5,8
Corydalis flavula	corydalis	4	-	-	4
Cruciferae					
Alliaria officinalis	garlic mustard	4,5,6	4,5,6	4	4,5
Arabidopsis thaliana	mouse-ear cress	-	-	4	4
Barbarea vulgaris	winter cress	4	4,5	4,5	4,5
Brassica campestris	field mustard	-	4,5	5	-
Capsella bursa-pastoris	shepard's purse	-	-	-	4
Cardamine bulbosa	bitter cress	-	4	-	-
Cardamine hirsuta	bitter cress	4	4	4	4
Dentaria laciniata	cut-leaf toothwort	-	4	-	-
Erysimum cheiranthoides	wormseed mustard	-	6	-	-
Hesperis matronalis	dame's rocket	5	5,6	-	-
Lepidium campestre	peppergrass	4	-	4	4,5
Thalaspi arvense	penny-cress	-	-	-	4

1565 247

POOR ORIGINAL

Table 6.1-1 continued.

Taxon	Common Name	Month Observed			
		TMI	Shelley Is	RT 262	East Side
Crassulaceae					
Sedum ternatum	stonecrop	-	-	5	-
Saxifragaceae					
Saxifraga virginiensis	saxifrage	-	-	4	4
Rosaceae					
Geum canadense	avens	6,7	6,7	-	6
Potentilla norvegica	cinquefoil	-	-	6	6,7
Potentilla recta	cinquefoil	-	-	5,6	5
Potentilla simplex	cinquefoil	5	-	4	4
Prunus avium	sweet cherry	-	-	-	4
Pyrus malus	apple	-	-	4	4
Rosa multiflora	multiflora rose	-	-	5	5
Rosa palustris	swamp rose	-	-	-	6
Rubus allegheniensis	blackberry	5	5,6	5	5,6
Rubus flagellaris	dewberry	-	-	5	5
Rubus phoenicolasius	wineberry	-	-	-	5
Mimosaceae					
Albizzia julibrissin	mimosa-tree	-	-	6	-
Caesalpiniaceae					
Cassia fasciculata	partridge pea	-	-	-	7,8
Cercis canadensis	redbud	-	-	-	4
Leguminosae					
Apios americana	groundnut	-	8	-	-
Coronilla varia	crown vetch	-	-	6	5-10
Desmodium viridiflorum	tick-trefoil	8	-	-	8
Lathyrus latifolius	everlasting pea	-	-	-	6
Medicago lupulina	black medick	-	-	6,7	6
Medicago sativa	alfalfa	-	-	-	6,7,9
Melilotus alba	white sweet clover	-	-	6	6,8
Melilotus officinalis	yellow sweet clover	-	-	5,6,7	5,6,7
Robinia pseudoacacia	black locust	-	-	-	5
Strophostyles helveola	wild bean	-	-	-	8
Trifolium agrarium	white clover	-	6	5,6	5,6,9,10
Trifolium arvense	rabbit's foot clover	-	-	-	8
Trifolium hybridum	white clover	-	-	6,7	6,7
Trifolium pratense	red clover	-	-	5,7-10	5-10
Trifolium procumbens	hop clover	-	-	5	5
Vicia cracca	cow vetch	-	-	-	5,6
Oxalidaceae					
Oxalis sp.	wood sorrel	-	6,7	6,7,9	6,8,9
Geraniaceae					
Geranium carolinianum	Carolina crane's bill	-	-	-	5
Euphorbiaceae					
Euphorbia cyparissias	cypress spurge	-	-	-	4
Euphorbia preslii	spurge	-	-	-	7,8
Anacardiaceae					
Rhus radicans	poison ivy	5	5	5	5
Rhus typhina	staghorn sumac	-	-	-	5
Balsaminaceae					
Impatiens biflora	jewelweed	6,7,8	6-9	7,8	6-9
Impatiens pallida	jewelweed	9	6,7,8	7,8	7,8,9

1565 248

POOR ORIGINAL

Table 6.1-1 continued.

Taxon	Common Name	Month Observed			
		TMI	Shelley Is	RT 262	East Side
Vitaceae					
Vitis aestivalis	summer grape	5	5	5	5
Hypericaceae					
Hypericum perforatum	St. John's wort	-	-	7	6,7
Violaceae					
Viola eriocarpa	yellow violet	-	4	-	-
Viola papilionacea	blue violet	4	4	4	4
Viola rafinesquii	wild pansy	4	-	4	4
Viola sororia	blue violet	4	-	-	-
Viola striata	white violet	4	4,5	-	-
Lythraceae					
Lythrum salicaria	purple loosestrife	-	-	-	8
Onagraceae					
Epilobium coloratum	willow herb	-	-	8	8
Oenothera biennis	evening primrose	-	-	7,8	7,8,10
Umbelliferae					
Conium maculatum	poison hemlock	5	-	-	-
Daucus carota	Queen Anne's lace	-	-	6-10	6-10
Osmorrhiza longistylis	sweet cicely	-	-	4	4
Cornaceae					
Cornus florida	flowering dogwood	-	4	4	4
Ericaceae					
Kalmia latifolia	mountain laurel	-	-	5	-
Primulaceae					
Anagallis arvensis	scarlet pimpernel	-	-	-	8
Lysimachia ciliata	fringed loosestrife	-	6,7	-	6,7
Apocynaceae					
Apocynum medium	dogbane	6	-	-	5,6,7,9
Vinca minor	periwinkle	-	-	-	4
Asclepiadaceae					
Asclepias incarnata	swamp milkweed	-	6	-	7,8
Asclepias syriaca	common milkweed	-	-	6	6,7
Convolvulaceae					
Convolvulus sepium	black bindweed	-	-	-	6
Ipomoea purpurea	wild morning-glory	-	-	-	8,9
Polemoniaceae					
Phlox divaricata	blue phlox	-	-	4	4
Hydrophyllaceae					
Hydrophyllum virginianum	waterleaf	-	-	5	-
Boraginaceae					
Echium vulgare	blueweed	-	-	-	6,8
Hackelia virginiana	beggar's lice	7	-	-	8
Mertensia virginica	bluebells	-	4	4	4

POOR ORIGINAL

1565 249

Table 6.1-1 continued.

Taxon	Common Name	Month Observed			
		TMI	Shelley Is	RT 262	East Side
Verbenaceae					
Verbena urticifolia	white vervain	7,8	7	8	8
Labiatae					
Glechoma hederacea	ground ivy	4	4,6	4	4
Lamium amplexicaule	henbit	-	-	4	4
Lamium purpureum	dead nettle	-	-	-	4
Monarda clinopodia	bergamot	-	7	-	-
Nepeta cataria	catnip	-	-	-	6,7,8
Perilla frutescens	perilla	-	-	-	9
Prunella vulgaris	self-heal			-	8,9,10
Teucrium canadense	wood-sage	7	-	7	6,7
Trichostema dichotomum	blue-curls	-	-	-	8
Solanaceae					
Physalis longifolia	ground cherry	-	-	7,8	8,9
Solanum carolinense	horse nettle	-	-	-	6-9
Solanum dulcamara	bittersweet	-	-	5,6,7	6
Scrophulariaceae					
Chelone glabra	turtlehead	-	9	-	-
Linaria vulgaris	butter-and-eggs	-	-	5,7-10	6-10
Verbascum blattaria	moth mullein	-	-	-	6,8
Verbascum thapsis	common mullein	-	-	6	6,7,8
Veronica serpyllifolia	speedwell	-	4	5	5
Plantaginaceae					
Plantago lanceolata	English plantain	-	-	6,7	6,7
Rubiaceae					
Galium aparine	cleavers	5	-	-	5
Houstonia caerulea	bluets	-	-	-	4
Caprifoliaceae					
Lonicera japonica	Japanese honeysuckle	5,6	5,6,9	5-10	5-10
Lonicera tatarica	Tartarian honeysuckle	-	4,5	-	-
Sambucus canadensis	common elderberry		5,6	6	5,6
Viburnum prunifolium	black haw	4	-	-	4
Valerianaceae					
Valerianella locusta	corn salad	-	-	4	4
Cucurbitaceae					
Sicyos angulatus	bur cucumber	8,9	8,9	-	8
Campanulaceae					
Triodanus perfoliata	Venus' looking glass	-	-	-	6
Lobeliaceae					
Lobelia cardinalis	cardinal flower	-	8,9	-	-
Lobelia inflata	Indian tobacco	-	-	-	9
Lobelia siphilitica	great lobelia	-	-	-	8,9,10

POOR ORIGINAL

1565 250

POOR ORIGINAL

Table 6.1-1 continued.

Taxon	Common Name	Month observed			
		TMI	Shelley Is	RT 262	East Side
Asteraceae (Compositae)					
Achillea millefolium	yarrow	-	-	5,6,7,10	6,7
Ambrosia artemisiifolia	ragweed	-	-	8	8,9
Ambrosia trifida	giant ragweed	-	8	8	8,9
Anthemis cotula	chamomille	-	-	5	5
Arctium minus	burdock	-	-	-	8,9,10
Aster cordifolius	aster	-	-	9,10	9,10
Aster divaricatus	wood aster	-	-	9	9
Aster ericoides	heath aster	-	9,10	9,10	9,10
Aster novae-angliae	New England aster	-	-	-	9,10
Aster prenanthoides	aster	-	-	-	9,10
Aster simplex	aster	-	-	9,10	10
Bidens frondosa	beggar-ticks	-	9	9	9
Bidens laevis	bur-marigold	-	-	9	9
Chrysanthemum leucanthemum	ox-eye daisy	6	-	5-8,10	5,6
Cichorium intybus	chicory	-	-	6-10	6-10
Cirsium arvense	Canada thistle	-	-	6,9	6,7,8
Cirsium vulgare	bull thistle	-	-	6	7,8
Conyza canadensis	horseweed	-	-	7,8	6,8
Erechtites hieracifolia	fireweed	-	-	-	9
Erigeron annuus	fleabane	5,6	4,5,6	5-8	5-10
Eupatorium fistulosum	joe-pye weed	-	7,8	-	7,8
Eupatorium perfoliatum	boneset	-	7,8	8	8,9
Eupatorium rugosum	white snakeroot	7-10	8,9,10	8,9,10	6-10
Galinsoga ciliata	galinsoga	-	8	8,9	7-10
Gnaphalium obtusifolium	cudweed	-	-	9	-
Helenium autumnale	sneezeweed	-	9,10	-	-
Helianthus decapetalus	sunflower	8	7,8,9	-	9
Hieracium pilosella	mouse-ear hawkweed	-	-	5	5
Hieracium gratense	hawkweed	-	-	5	5
Lactuca canadensis	wild lettuce	-	-	8	-
Lactuca scriola	wild lettuce	-	-	7	7,8,9
Lapsana communis	nipplewort	-	-	5	-
Picris hieracioides	bitterweed	-	-	7-10	-
Rudbeckia hirta	black-eyed susan	-	-	6	6,7
Rudbeckia laciniata	coneflower	8	7	7,8	9
Rudbeckia triloba	coneflower	-	-	-	8
Solidago canadensis	goldenrod	-	-	9	9
Solidago flexicaulis	goldenrod	-	-	-	9
Solidago gigantea	goldenrod	7,8	8	8	8,9
Solidago graminifolia	grass-leaf goldenrod	-	-	8,9	7,8,9
Solidago juncea	early goldenrod	7	-	7,8,9	7
Solidago nemoralis	little grey goldenrod	-	-	8	-
Solidago rugosa	rough goldenrod	8,9,10	-	8,9,10	8,9,10
Taraxacum officinale	dandelion	4	4,5	4-10	4-10
Tragopogon pratensis	goat's beard	-	-	5	5
Verbesina alternifolia	wingstem	8,9	7-10	7-10	8,9
Vernonia noveboracensis	ironweed	-	-	-	8,9

1. Location of Transects
   Three Mile Island, south woodlot (PPT-9A1-9B1) - TMI
   Shelley Island, north woodlot and nature trail (PPT-13A1-15A1, PPT-13S1-15A1) - Shelley Is
   Route 262 (PPT-11B1-14B1) - RT 262
   Combined routes (PPT-1B1-9B1, PPT-2A1-5A1, PPT-5A2-7C1) - East Side (Route 441 and adjacent routes).

2. Arrangement of families and nomenclature follows Gleason and Cronquist (1963); scientific names arranged alphabetically within families.

3. Month indicated by number (4 = April, 5 = May, etc).

1565 251

POOR ORIGINAL

Table 6.1-2

Parasitic plant diseases observed on agricultural crops in plant pathology transects, April through October 1976.

Host Species	Disease[1]	Location[2]
Cucurbita pepo pumpkin	powdery mildew Erysiphe cichoracearum	1B1-8B1
Trifolium pratense red clover	powdery mildew Erysiphe polygoni	1B1-8B1, 14B1-11B1
Triticum aestivum wheat	wheat smut Ustilago tritici	1B1-8B1, 2A1-5A1
Zea mays corn	corn smut Ustilago maydis	5A2-7C1

1 Nomenclature from U.S. Department of Agriculture, 1960. Index of plant diseases in the United States, Agriculture Handbook No. 165. U.S. Government Printing Office. Washington, D.C. 531 pp.

2 Locations keyed as follows (prefix PPT omitted in Table)
PPT-14B1-to PPT-11B1 - Plot 24, Cly Road (Rt. 262) to Midway Road, Goldsboro
PPT-9A1 to PPT-9B1 - TMI, South woodlot
PPT-15A1 to PPT-13A1 - Shelley Island Nature Trail
PPT-15A1 to PPT-13A1 - Shelley Island, north woodlot baseline
PPT-1B1 to PPT-8B1 - Rt. 441 from first farm south of RR at Royalton to south access to TMI
PPT-2A1 to PPT-5A1 - Geyers Church Road from Rt. 441 to Gingrich Road to Zion Road to Pecks Road
PPT-5A2 to PPT-7C1 - Pecks Road at Rt. 441 to Falmouth Turnpike (RD 4).

1565 252

POOR ORIGINAL

Table 6.1-3

Parasitic plant diseases observed on natural vegetation in plant pathology transects, April through October 1976.

Host Species	Disease[1]	Location[2]
Acer negundo	leaf spot Phyllosticta minima	1B1-8S1, 15A1-13A1, 15A1-13S1
Acer saccharinum	leaf spot Phyllosticta minima	1B1-8B1, 15A1-13A1, 15A1-13S1
Ambrosia artemisiifolia	powdery mildew Erysiphe cichoracearum	2A1-5A1, 5A2-7C1
Ambrosia trifida	powdery mildew Erysiphe cichoracearum	14B1-11B1
Aster simplex	leaf rust Coleosporium solidaginis	14B1-11B1
Carya ovalis	anthracnose Gnomonia caryae	2A1-5A1, 14B1-11B1
Fraxinus sp.	anthracnose Gloeosporium aridum	1B1-8B1, 5A2-7C1, 14B1-11B1, 15A1-13S1
Lonicera japonica	powdery mildew Erysiphe cichoracearum	1B1-8B1
Platanus occidentalis	anthracnose Gnomonia platani	1B1-8B.
Platanus occidentalis	powdery mildew Microsphaera alni	14B1-11B1
Pyrus malus	apple scab Venturia inaequalis	14B1-11B1
Quercus bicolor	anthracnose Gnomonia veneta	2A1-5A1
Rubus alleghaniensis	orange rust Kunkelia nitens	2A1-5A1, 5A1-7C1, 14B1-11B1, 15A1-13A1
Rudbeckia laciniata	powdery mildew Erysiphe cichoracearum	14B1-11B1
Scrophularia marilandica	powdery mildew Erysiphe cichoracearum	9A1-9B1
Solidago canadensis	leaf rust Coleosporium solidaginis	1B1-8B1, 14B1-11B1
Solidago canadensis	powdery mildew Erysiphe cichoracearum	1B1-8B1
Solidago graminifolia	tar spot Placosphaera haydeni	14B1-11B1
Solidago rugosa	leaf rust Coleosporium solidaginis	9A1-9B1, 14B1-11B1
Solidago rugosa	powdery mildew Erysiphe cichoracearum	1B1-8B1, 9A1-9B1, 14B1-11B1
Syringa vulgaris	powdery mildew Microsphaera alni	1B1-8B1, 5A2-7C1
Trifolium pratense	powdery mildew Erysiphe polygoni	1B1-8B1, 2A1-5A1, 14B1-11B1
Verbesina alternifolia	powdery mildew Erysiphe cichoracearum	1B1-8B1, 2A1-5A1, 5A2-7C1, 9A1-9B1, 14B1-11B1, 15A1-13S1
Vernonia noveboracensis	powdery mildew Erysiphe cichoracearum	2A1-5A1

1 Nomenclature from USDA (1960)
2 Locations listed in Table 6.1-2.

1565 253

Table 6.1-4

Vegetation exhibiting significant insect damage in plant pathology transects, April through October 1976.

Host Species	Insect Agent	Location*
Acer saccharinum	leaf gall *Eriophyes* sp.	13A1-15A1
Celtis occidentalis	leaf gall *Pachypsilla* sp.	1B1-8B1, 2A1-5A1, 5A2-7C1, 14B1-11B1, 15A1-13A1, 15A1-13S1
Juglans nigra	fall webworm *Hyphantria cunea*	14B1-11B1
Prunus serotina	gall mite *Eriophyes* sp.	9A1-9B1
Prunus serotina	tent caterpillar *Malacosoma americanum*	1B1-8B1, 2A1-5A1
Prunus serotina	fall webworm *Hyphantria cunea*	1B1-8B1, 2A1-5A1, 14B1-11B1
Pyrus malus	fall webworm *Hyphantria cunea*	14B1-11B1
Robinia pseudoacacia	locust leaf miner *Odontota dorsalis*	1B1-8B1, 9A1-9B1
Sassafras albidum	Japaness beetle *Popillia japonica*	2A1-5A1
Ulmus americana	Japaness beetle *Popillia japonica*	1B1-8B1, 5A2-7C1, 14B1-11B1
Vitis sp.	leaf gall unidentified	1B1-8B1

* Locations listed in Table 6.1-2.

POOR ORIGINAL

1565 254

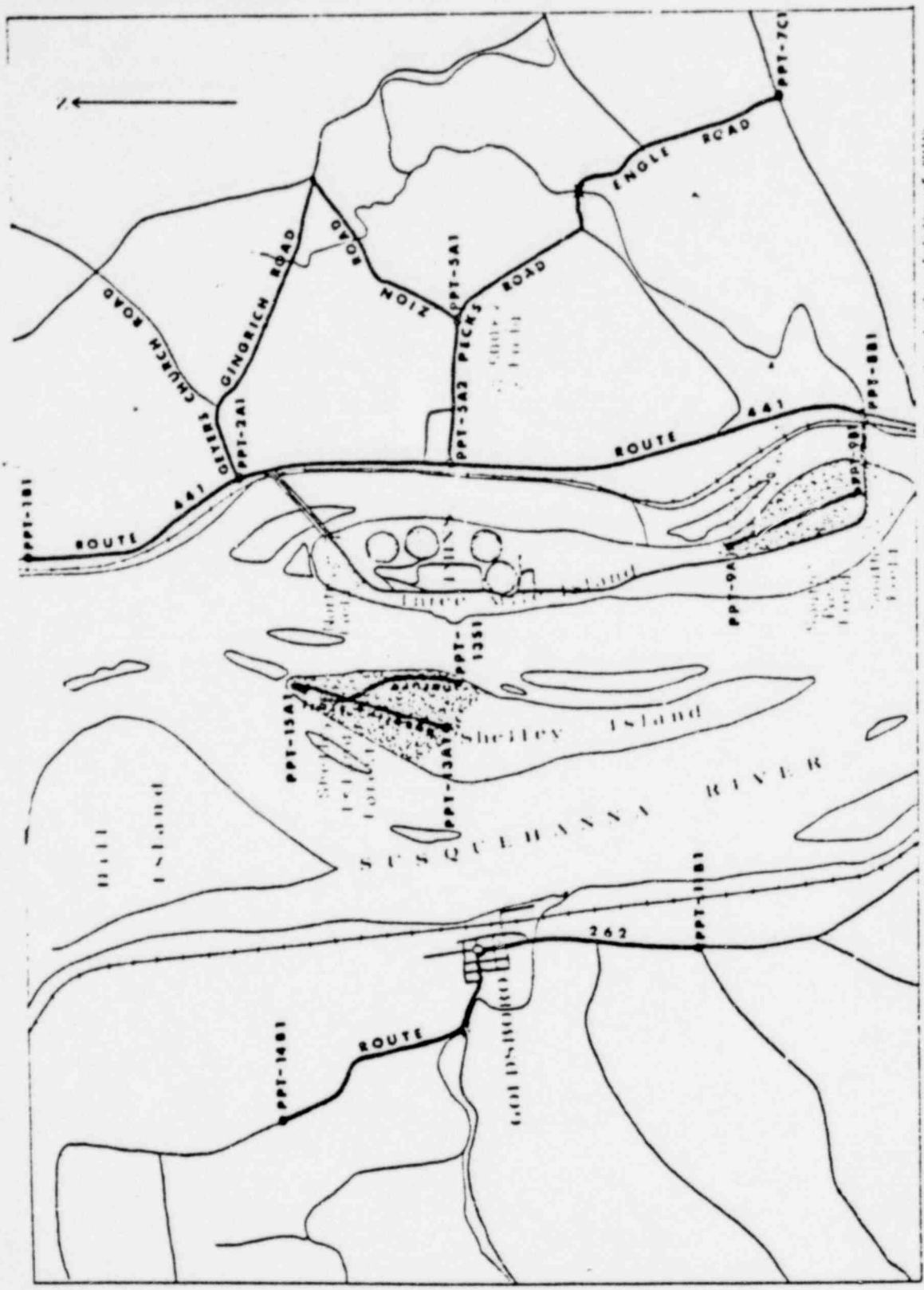

Figure 6.1-1 Location of salt drift transects (heavy lines) and areas of quantitative vegetation study, in the vicinity of PPL.

POOR ORIGINAL

1565 255

6.2 QUANTITATIVE VEGETATION STUDIES

6.2.1 METHODS

Woodlots and fields surveyed in 1973, 1974, and 1975 were surveyed during late August through mid-October 1976. The bottomland hardwood forest on Shelley Island and the south woodlot on Three Mile Island were surveyed for trees, saplings, shrubs, vines, and groundcover (Figure 6.1-1). The north field, south field, and field near the south ponds on Three Mile Island, and the field near the 500 kv substation just east of Route 441 were sampled for groundcover. Permanent plots and transect lines used in previous years (1973-1975) were used again. Methods for sampling followed those of previous years (Woodward-Envicon, Inc. 1974, 1975; Potter and Associates 1976; Nardacci et al. 1976).

Data from 1976 were compared to those from 1973, the pre-operational sampling, (Woodward-Envicon, Inc. 1974), 1974 (Woodward-Envicon, Inc. 1975) and 1975 (Potter and Associates 1976). Plot by plot tests for significance of changes were made using Student's t-test for paired observations. The number of stems was used for trees, saplings, shrubs, and woody vines, and the percent coverage for all groundcover plots. Statistical formulas used are given in Potter and Associates (1976). Data from 1976 were statistically compared with those from 1975 and 1973. The comparisons with 1974 data were not tested statistically since 1974 and 1973 data were similar in general, and significance of changes from 1974 to 1976 can be inferred from 1976 to 1975 and 1976 to 1973 tests. Significance tests were made on the same taxa as in 1975, except where a taxon was absent or in a frequency too low to permit tests (present in only one or two plots) in 1976.

POOR ORIGINAL

1565 256

Common names are used throughout the text and in the tables where space permits. To avoid confusion, scientific names are used in tables and given at the first use of each taxon in the text. Scientific nomenclature follows Gleason and Cronquist (1963).

6.2.2 RESULTS

In the bottomland hardwood forest on Shelley Island changes in the overstory (trees and saplings) were small (Table 6.2-1). Elm (Ulmus americana) decreased between 1973 and 1976, and silver maple (Acer saccharinum) saplings increased significantly between 1973 and 1976. There were no significant changes in shrubs and vines between 1976 and 1975 or 1973 (Table 6.2-2). The most important groundcover taxa were jewelweed (Impatiens spp.), Virginia knotweed (Polygonum virginianum), Japanese honeysuckle (Lonicera japonica), violet (Viola spp.), poison ivy (Rhus radicans), and false nettle (Boehmeria cylindrica); 57 taxa were represented (Table 6.2-3). Non-vegetative cover decreased significantly between 1975 and 1976, but increased significantly from 1973 to 1976 (Table 6.2-4). Some of the areas cleared in 1975 were again covered with vegetation in 1976, causing a decrease in the amount of non-vegetative cover. Jewelweed increased significantly in 1976, and was one of the important invaders in areas previously cleared. Other significant increases observed included poison ivy (1975-1976), Virginia creeper (Parthenocissus quinquefolia)(1975-1976), Japanese honeysuckle (1973-1976), false nettle (1973-1976), and avens (Geum canadense)(1973-1976). Significant decreases occurred between 1975 and 1976 in avens, and between 1973 and 1976 in Virginia knotweed, violet, poison ivy, Virginia creeper, and clearweed

POOR ORIGINAL

1565 257

POOR ORIGINAL

(Pilea pumila) (Table 6.2-4). Seedlings of nine trees were found (Table 6.2-5). Silver maple decreased but was still the most abundant; ash (Fraxinus sp.) increased and was the second most abundant, with river birch (Betula nigra) third in abundance.

In the south forest on Three Mile Island the only significant change was a decrease in black locust (Robinia pseudoacacia) saplings (Table 6.2-6). Non-significant decreases also occurred for most other dominant trees and saplings. There were no significant changes in the shrub or vine taxa in this forest (Table 6.2-7). The groundcover is divided into "vine" and "non-vine" portions of the forest. The most important plants in the "vine" portion were clearweed, Japanese honeysuckle, violet, Virginia knotweed, and false nettle; non-vegetative cover had the highest importance value in the forest groundcover (Table 6.2-8). Thirty-seven taxa were recorded (40 in 1975). Non-vegetative cover increased significantly from 1975 to 1976 and 1973 to 1976 (Table 6.2-9). Violet and avens also increased from 1975 to 1976; Virginia knotweed, false buckwheat (Polygonum scandens), jewelweed, pokeweed (Phytolacca americana), Virginia creeper, and poison ivy decreased from 1975 to 1976. Some of these changes continue trends from 1973 to 1975, others such as Virginia creeper and jewelweed are reversals of trends. Seedlings of five tree species were found; tree-of-heaven (Ailanthus altissima) was the most abundant (Table 6.2-10).

In the "non-vine" portion of the south forest dominants were clearweed, grasses, goldenrod (Solidago spp.), false nettle, and avens (Table 6.2-11). Non-vegetative cover had the highest importance value in the groundcover.

1565 258

Forty taxa were recorded (46 in 1975). Significant increases from 1975 to 1976 were found in non-vegetative cover, and clearweed, and significant decreases from 1975 to 1976 in violet, blackberry (Rubus spp.), false buckwheat, and cinquefoil (Potentilla simplex) (Table 6.2-12). All of these except false buckwheat showed the same change from 1973 to 1976 (non-significant for violet). Other significant changes from 1973 to 1976 (Table 6.2-12) were the same as changes reported for 1973 to 1975. Seedlings of five tree species were found (Table 6.2-13).

In the south field on Three Mile Island, 66 taxa were found in 1976 (Table 6.2-14). Heath aster (Aster ericoides), grasses, goldenrod, blackberry, and white sweet clover (Melilotus alba) were the dominant taxa. Non-vegetative cover, goldenrod, and Canada thistle (Cirsium arvense) decreased significantly, and blackberry increased from 1975 to 1976 (Table 6.2-15). Significant decreases from 1973 to 1976 were found in Canad thistle, nodding foxtail (Setaria faberii), horse nettle (Solanum carolinense), ragweed (Ambrosia artemisiifolia), and beggar-ticks (Bidens frondosa), and significant increases in heath aster, blackberry, and non-vegetative cover from 1973 to 1976. Seedlings of three taxa were found (Table 6.2-16).

In the field near the south ponds on Three Mile Island, 38 taxa were recorded (Table 6.2-17). Heath aster, grasses, evening primrose (Oenothera biennis), goldenrod, and ragweed were the dominants. Significant increases from 1975 to 1976 were found in heath aster, goldenrod, ragweed, and smartweed (Polygonum spp.), and significant decreases from 1975 to 1976 in sheep sorrel (Rumex acetosella), Canada thistle, horse nettle, and horseweed (Conyza

1565 259

canadensis) (Table 6.2-18). Significant increases from 1973 to 1976 were found for heath aster, evening primrose, and non-vegetative cover, and decreases for goldenrod, Canada thistle, smartweed, nodding foxtail, horse nettle, and horseweed. No beggar-ticks or cocklebur (Xanthium strumarium) were found in 1976 (Table 6.2-18). Seedlings of silver maple and ash were found; these represent the first seedlings encountered in this field (Table 6.2-19).

In the north field on Three Mile Island, 80 taxa were recorded in 1976 (Table 6.2-20). Heath aster, grasses, goldenrod, blackberry, and Japanese honeysuckle were the dominants. Significant increases from 1975 to 1976 were found for goldenrod, and decreases for blackberry, tick trefoil (Desmodium sp.), nodding foxtail, and St. John's wort (Hypericum punctatum) (Table 6.2-21). These changes were also found from 1973 to 1976, plus increases in heath aster and non-vegetative cover, and decreases in horse nettle and ragweed. Seedlings of four taxa were found; three of these represented new taxa, and eight species of seedlings found in previous years were not recorded in 1976 (Table 6.2-22).

In the field near the 500 kv substation, east of Route 441, 39 taxa were recorded in 1976 (Table 6.2-23). Heath aster, goldenrod, crown vetch (Coronilla varia), and Canada thistle were the dominants. Heath aster and goldenrod were dominant in the upper part of the field, with crown vetch forming dense cover on much of the lower part of the field. Canada thistle was found mostly on the upper part of the field. The only significant changes between 1975 and 1976 were an increase in goldenrod and a decrease in

1565 260

POOR ORIGINAL

common plantain (Plantago major) (Table 6.2-24). Goldenrod and crown vetch increased significantly from 1974 to 1976; heath aster, common plantain, dandelion (Taraxacum officinale), and red clover (Trifolium pratense) decreased from 1974 to 1976 (Table 6.2-24). Seedlings of white pine (Pinus strobus), and red maple (Acer rubrum) were found (Table 6.2-25).

6.2.3 DISCUSSION

As in 1975, there were few changes in the overstory and understory of the forests in 1976. The increase in jewelweed and decrease in non-vegetative cover in the Shelley Island forest were related to less disturbance of the forest in 1976. No plots were omitted because of new disturbance in this forest in 1976.

In the Three Mile Island forest some changes, including increase in non-vegetative cover and violet, and decrease in goldenrod, blackberry, and cinquefoil are probably successional in nature. This trend was also observed in 1975 (Potter and Associates 1976). Other changes show no pattern with respect to succession and may represent seasonal responses to growing conditions in the forests. Local disturbances by man and animals may also cause temporary changes in the patterns of vegetation. No pattern was apparent when the Shelley Island forest and the Three Mile Island forest were compared that could be related to the operation of TMINS.

Most of the changes in the four fields were successional in nature: increases in perennials such as heath aster, goldenrod, and blackberry and decreases in annuals including horseweed, nodding foxtail, beggar-ticks,

1565 261

and ragweed, and short-lived perennials including horse nettle and Canada thistle. This pattern is evident in the south field (Table 6.2-15) and the field near the south ponds (Table 6.2-18). In the north field on Three Mile Island an increase in moisture is evidently occurring at the edge of the field near the TMINS dike. Cat-tail (Typha latifolia) was recorded for the first time in 1976; a small stand has developed along the base of the dike. There was also more open water in 1976 than in 1975.

No pattern of change was observed in any of the fields, or in comparison between the fields with respect to the location of TMINS, that could be related to the operation of the TMINS cooling towers.

Gleason, H.A. and A. Cronquist. 1963. Manual of Vascular Plants of Northeastern United States and Adjacent Canada. D. Van Nostrand Company, Princeton, N.J. 810 pp.

Nardacci, G.A., W.A. Potter, J.H. Epler, III, R.F. Eppley, Jr., R.E. Evans, H.A. Hagerty, J.H. Kennedy, B.F. Lathrop, R.W. Malick, Jr., J.D. Montgomery, J.L. Polk, P.C. Ritson, and L. Wike. 1976. An ecological study of the Susquehanna River in the vicinity of the Three Mile Island Nuclear Station. Supplemental Report for 1975. Ichthyological Associates, Inc. 249 pp.

Potter, W.A. and Associates. 1976. An ecological study of the Susquehanna River in the vicinity of the Three Mile Island Nuclear Station. Annual Report for 1975. Ichthyological Associates, Inc. 395 pp.

Woodward-Envicon, Inc. 1974. Three Mile Island Nuclear Station, Units 1 and 2. Terrestrial Environmental Studies. Pre-operational Survey. 330 pp.

Woodward-Envicon, Inc. 1975. Three Mile Island Nuclear Station, Units 1 and 2. Terrestrial Environmental Studies. Post-operational Survey. 53 pp.

1565 262

Table 6.2-1

Comparison of trees and saplings on 24 selected plots in the bottomland hardwood forest on Shelley Island, 1973-1976.

Species	Common Name	Number of Plots				Number of Stems				Basal Area				1976 vs 1975		1976 vs 1973	
		1973	1974	1975	1976	1973	1974	1975	1976	1973	1974	1975	1976	t	Significance[1]	t	Significance
TREES																	
Acer saccharinum	silver maple	12	10	11	10	21	20	18	15	25.106	23.114	28.257	26.895	-1.606	NS	-1.904	NS
Fraxinus sp.	ash	8	7	7	6	15	14	10	9	3.677	3.488	2.809	2.689	-0.446	NS	-1.596	NS
Ulmus americana	elm	7	7	5	3	10	10	8	5	5.400	5.729	5.921	5.290	-1.702	NS	-2.358	*
Betula nigra	river birch	4	4	3	3	13	13	8	6	5.861	5.790	3.197	2.577	-	-	-	-
Robinia pseudoacacia	black locust	3	3	3	3	5	4	5	4	3.091	2.955	4.913	4.471	-	-	-	-
Platanus occidentalis	sycamore	3	3	3	2	3	3	3	2	1.925	1.925	2.187	0.841	-	-	-	-
Carya cordiformis	bittermut hickory	3	3	2	1	4	4	2	1	6.916	6.940	2.377	2.181	-	-	-	-
Sassafras albidum	sassafras	2	2	1	1	2	2	3	1	0.403	0.485	0.632	0.349	-	-	-	-
Liriodendron tulipifera	tulip tree	1	1	1	1	1	1	1	1	0.921	1.068	1.068	1.068	-	-	-	-
Catalpa speciosa	catalpa	1	1	1	1	1	1	1	1	0.442	0.442	0.394	0.394	-	-	-	-
SAPLINGS																	
Acer saccharinum	silver maple	10	12	13	14	36	44	656	404	-	-	-	-	-0.582	NS	2.297	*
Acer negundo	box elder	9	10	10	12	69	77	49	47	-	-	-	-	0.628	NS	-0.458	NS
Fraxinus sp.	ash	7	8	7	10	40	44	27	22	-	-	-	-	-0.146	NS	-0.596	NS
Ulmus americana	elm	7	7	7	8	25	23	18	21	-	-	-	-	0.674	NS	-0.065	NS
Carya cordiformis	bittermut hickory	3	3	4	5	14	17	22	15	-	-	-	-	-	-	-	-
Prunus serotina	black cherry	2	4	5	4	2	7	18	23	-	-	-	-	-	-	-	-
Morus rubra	red mulberry	1	3	4	4	1	6	6	7	-	-	-	-	-	-	-	-
Asimina triloba	paw-paw	2	3	3	4	33	47	54	28	-	-	-	-	-	-	-	-
Sassafras albidum	sassafras	0	2	2	2	0	29	36	18	-	-	-	-	-	-	-	-
Liriodendron tulipifera	tulip tree	0	1	2	1	0	1	6	5	-	-	-	-	-	-	-	-
Ailanthus altissima	tree-of-heaven	0	0	2	1	0	0	2	1	-	-	-	-	-	*	-	-
Celtis occidentalis	hackberry	2	1	2	1	2	1	2	1	-	-	-	-	-	-	-	-
Platanus occidentalis	sycamore	1	1	1	1	1	1	1	1	-	-	-	-	-	-	-	-
Quercus borealis	red oak	1	1	1	1	1	1	1	1	-	-	-	-	-	-	-	-
Robinia pseudoacacia	black locust	1	1	1	1	1	1	1	1	-	-	-	-	-	-	-	-
Betula nigra	river birch	0	0	2	0	0	0	2	0	-	-	-	-	-	-	-	-
Carya sp.	hickory	0	0	1	0	0	0	1	0	-	-	-	-	-	-	-	-
Cornus florida	flowering dogwood	0	0	1	0	0	0	1	0	-	-	-	-	-	-	-	-

1 Significance tests made on taxa occurring in five or more plots; ** = significant at 0.01 level, * = significa at 0.05 level, NS = not significant.

POOR ORIGINAL

1565 263

Table 6.2-2

Comparison of shrubs and vines on 24 selected plots in the bottomland hardwood forest on Shelley Island, 1973-1976.

Species	Common Name	Number of Plots				Number of Stems				1976 vs 1975		1976 vs 1973	
		1973	1974	1975	1976	1973	1974	1975	1976	t	Significance[1]	t	Significance
SHRUBS													
Lindera benzoin	spicebush	21	22	22	21	252	250	228	211	-0.718	NS	-0.759	NS
Sambucus canadensis	elderberry	11	16	17	15	148	186	117	161	0.578	NS	0.626	NS
Alnus serrulata	speckled alder	4	5	3	4	17	19	19	8	-	-	-	-
Lonicera japonica	honeysuckle	1	1	2	3	2	2	5	5	-	-	-	-
Rhus typhina	staghorn sumac	0	0	2	1	0	0	2	1	-	-	-	-
VINES													
Vitis sp.	grape	9	11	13	12	68	61	46	43	-0.787	NS	-0.325	NS
Parthenocissus quinquefolia	Virginia creeper	12	12	8	12	43	40	21	32	1.911	NS	-0.420	NS
Rhus radicans	poison ivy	12	11	9	11	43	48	84	48	0.298	NS	-0.635	NS
Celastrus scandens	bittersweet	1	1	4	4	3	1	4	7	-	-	-	-

1 Significance tests made on taxa occurring in five or more plots; ** = significant at 0.01 level, * = significant at 0.05 level, NS = not significant.

1565 264

POOR ORIGINAL

POOR ORIGINAL

Table 6.2-3

Ground cover occurring in the bottomland hardwood forest on Shelley Island, 1976.

Species	Common Name	Relative Frequency (percent)	Relative Coverage (percent)	Importance Value
Non-vegetative cover	-	10.25	34.67	44.92
Impatiens spp.	jewelweed	9.54	18.77	28.31
Polygonum virginianum	Virginia knotweed	8.24	7.44	15.68
Lonicera japonica	Japanese honeysuckle	6.70	7.95	14.65
Viola spp.	violet	8.60	2.81	11.41
Rhus radicans	poison ivy	6.28	4.88	11.16
Boehmeria cylindrica	false nettle	6.05	4.38	10.43
Geum canadense	avens	5.33	1.14	6.47
Parthenocissus quinquefolia	Virginia creeper	5.33	0.96	6.29
Polygonum scandens	false buckwheat	3.38	2.73	6.11
grass (unidentified)	grass	4.03	1.27	5.30
Pilea pumila	clearweed	2.67	1.05	3.72
Celastrus scandens	bittersweet	1.54	1.97	3.51
Onoclea sensibilis	sensitive fern	2.37	1.08	3.45
Commelina communis	dayflower	1.78	1.31	3.09
Helianthus decapetalus	sunflower	1.54	1.42	2.96
Rubus sp.	blackberry	1.54	0.88	2.42
Verbesina alternifolia	wingstem	1.42	0.52	1.94
Urtica dioica	nettle	1.13	0.67	1.80
Eupatorium rugosum	white snakeroot	1.13	0.50	1.63
Phytolacca americana	pokeweed	1.19	0.40	1.59
Sicyos angulatus	bur cucumber	1.19	0.24	1.43
Polygonum sp.	smartweed	0.95	0.44	1.39
Matteuccia struthiopteris	ostrich fern	0.47	0.75	1.22
Vitis sp.	grape	0.83	0.25	1.18
Glechoma hederacea	ground ivy	0.83	0.29	1.12
Oxalis sp.	wood sorrel	0.77	0.06	0.83
Rudbeckia laciniata	coneflower	0.53	0.17	0.70
Lysimachia ciliata	loosestrife	0.59	0.09	0.68
Hesperis matronalis	dame's rocket	0.47	0.05	0.52
Lysimachia nummularia	moneywort	0.30	0.04	0.34
Rumex altissimus	water dock	0.30	0.04	0.34
Polygonum cuspidatum	Mexican bamboo	0.12	0.17	0.29
Solidago sp.	goldenrod	0.18	0.10	0.28
Menispermum canadense	moonseed	0.18	0.06	0.24
Teucrium canadense	wood sage	0.18	0.06	0.24
Athyrium filix-femina	lady fern	0.18	0.04	0.22
Carex sp.	sedge	0.18	0.04	0.22
Eupatorium maculatum	Joe-Pye weed	0.18	0.03	0.21
Acalypha virginica	three-seeded mercury	0.18	0.02	0.20
Aster divericatus	white wood aster	0.12	0.06	0.18
Potentilla simplex	cinquefoil	0.12	0.03	0.15
Thalictrum polygamum	tall meadow rue	0.12	0.02	0.14
Solanum carolinense	horse nettle	0.12	0.01	0.13
Allium vineale	wild garlic	0.12	0.00*	0.12
Scrophularia marilandica	figwort	0.06	0.03	0.09
Arisaema triphyllum	jack-in-the-pulpit	0.06	0.02	0.08
Monarda clinopodia	bergamot	0.06	0.02	0.08
Rubus strigosus	red raspberry	0.06	0.02	0.08
Gelium aparine	bedstraw	0.06	0.01	0.07
Hypericum punctatum	St. John's wort	0.06	0.01	0.07
Oenothera biennis	evening primrose	0.06	0.01	0.07
Plantago major	common plantain	0.06	0.01	0.07
Rumex acetosella	sheep sorrel	0.06	0.01	0.07
Botrychium dissectum	grape fern	0.06	0.00	0.06
Chelidonium majus	celandine	0.06	0.00	0.06
Cuscuta sp.	dodder	0.06	0.00	0.06
Stellaria media	chickweed	0.06	0.00	0.06

* Indicates less than 0.005 percent relative coverage.

1565 265

Table 6.2-4

Comparison of dominant ground cover[1] occurring in the bottomland hardwood forest on Shelley Island, 1973-1976.

Species	Relative Frequency				Relative Coverage				Importance Value				1976 vs 1975		1976 vs 1973	
	1973	1974	1975	1976	1973	1974	1975	1976	1973	1974	1975	1976	t	Significance[2]	t	Significance
Non-vegetative cover	9.7	9.8	11.5	10.2	17.0	14.3	49.3	34.7	26.7	24.1	60.8	44.9	-5.716	**	12.612	**
Impatiens spp.	9.0	8.5	7.7	9.5	11.4	13.6	7.2	18.8	20.4	22.1	14.9	28.3	10.633	**	6.023	**
Polygonum virginianum	8.9	9.7	9.1	8.2	18.0	16.3	6.6	7.4	26.9	26.0	15.7	15.7	1.698	NS	-6.850	**
Lonicera japonica	5.4	7.6	7.3	6.7	6.0	9.7	7.6	8.0	11.4	17.3	14.9	14.7	1.478	NS	4.089	**
Viola spp.	9.3	4.3	8.5	8.6	10.5	4.1	3.3	2.8	19.8	8.4	11.8	11.4	0.152	NS	-7.369	**
Rhus radicans	7.8	7.7	4.9	6.3	8.7	6.6	1.7	4.9	16.5	14.3	6.6	11.2	2.202	*	-7.550	**
Boehmeria cylindrica	5.1	6.9	7.7	6.0	4.0	5.4	4.3	4.4	9.1	12.3	12.0	10.4	0.139	NS	2.156	*
Geum canadense	0.6	4.6	5.5	5.3	0.2	1.3	2.3	1.1	0.8	5.9	7.8	6.5	-2.541	*	8.202	**
Parthenocissus quinquefolia	5.6	3.7	2.9	5.3	2.1	1.7	1.1	1.0	7.7	5.4	4.0	6.3	4.275	**	-3.282	**
Pilea pumila	5.4	5.1	2.7	2.7	4.4	4.4	0.7	1.0	9.8	9.5	3.4	3.7	1.265	NS	-5.645	**

1 Dominant ground cover is defined as any taxon with percent frequency equal to or greater than .30.
2 ** = significant at 0.01 level, * significant at 0.05 level, NS = not significant.

Table 6.2-5

Tree seedlings in bottomland hardwood forest on Shelley Island, 1973, 1975, and 1976.

Species	Common Name	Seedlings/Acre		
		1973	1975	1976
Acer saccharinum	silver maple	9663.5	672.8	290.5
Fraxinus sp.	ash	67.3	83.4	150.8
Betula nigra	river birch	0.0	150.1	134.1
Carya cordiformis	bitternut hickory	38.5	66.7	72.6
Prunus serotina	black cherry	81.7	33.4	33.5
Quercus palustris	pin oak	0.0	5.6	22.4
Acer negundo	box elder	96.2	44.5	5.6
Ailanthus altissima	tree-of-heaven	19.2	5.6	5.6
Liriodendron tulipifera	tulip tree	0.0	0.0	5.6

1565 266

POOR ORIGINAL

Table 6.2-6

Comparison of trees and saplings on 17 selected plots in the south forest on Three Mile Island, 1973-1976.

Species	Common Name	Number of Plots				Number of Stems				Basal Area				1976 vs 1975		1976 vs 1973	
		1973	1974	1975	1976	1973	1974	1975	1976	1973	1974	1975	1976	t	Significance[1]	t	Significance
TREES																	
Robinia pseudoacacia	black locust	14	14	13	13	43	47	33	34	15.062	15.830	10.159	9.185	0.424	NS	-1.187	NS
Prunus serotina	black cherry	7	7	9	9	19	19	16	16	5.828	6.079	5.489	5.677	-0.104	NS	-0.074	NS
Juglans nigra	black walnut	4	4	3	2	4	4	4	2	0.964	1.024	1.168	0.443	-	-	-	-
Quercus palustris	pin oak	1	1	1	1	2	2	2	2	0.578	0.578	0.796	0.927	-	-	-	-
Ailanthus altissima	tree-of-heaven	2	3	3	1	7	9	7	1	1.034	1.159	1.065	0.230	-	-	-	-
Acer negundo	box elder	1	1	1	0	1	1	1	0	0.267	0.267	0.307	0.000	-	-	-	-
SAPLINGS																	
Ailanthus altissima	tree-of-heaven	10	11	9	10	78	69	35	32	-	-	-	-	-0.263	NS	-1.723	NS
Prunus serotina	black cherry	11	14	12	9	54	57	42	33	-	-	-	-	-2.354	NS	-1.895	NS
Robinia pseudoacacia	black locust	10	10	8	7	22	20	19	12	-	-	-	-	-1.520	NS	-2.358	*
Juglans nigra	black walnut	4	5	4	4	5	6	4	5	-	-	-	-	0.372	NS	0.000	NS
Fraxinus sp.	ash	1	4	3	3	1	24	19	19	-	-	-	-	-	-	-	-
Acer saccharinum	silver maple	0	0	1	1	0	0	1	2	-	-	-	-	-	-	-	-
Celtis occidentalis	hackberry	0	0	0	1	0	0	0	2	-	-	-	-	-	-	-	-
Acer negundo	box elder	1	1	3	1	1	1	3	1	-	-	-	-	-	-	-	-
Sassafras albidum	sassafras	2	3	1	1	3	8	1	1	-	-	-	-	-	-	-	-
Acer rubrum	red maple	0	0	1	0	0	0	2	0	-	-	-	-	-	-	-	-

1 Significance tests made on taxa occurring in five or more plots; ** = significant at 0.01 level, * = significant at 0.05 level, NS = not significant.

Table 6.2-7

Comparison of shrubs and vines on 17 selected plots in the south forest on Three Mile Island, 1973-1976.

Species	Common Name	Number of Plots				Number of Stems				1976 vs 1975		1976 vs 1973	
		1973	1974	1975	1976	1973	1974	1975	1976	t	Significance[1]	t	Significance
SHRUBS													
Lindera benzoin	spicebush	6	7	7	7	15	19	31	36	0.021	NS	1.332	NS
Rhus typhina	staghorn sumac	0	0	0	1	0	0	0	1	-	-	-	-
VINES													
Vitis sp.	grape	10	12	10	11	82	82	65	64	0.470	NS	-0.410	NS
Parthenocissus quinquefolia	Virginia creeper	10	10	11	8	33	40	17	21	-0.376	NS	-1.567	NS
Rhus radicans	poison ivy	5	7	4	5	23	23	11	18	1.247	NS	-0.142	NS
Celastrus scandens	bittersweet	0	0	0	2	0	0	0	6	-	-	-	-

1 Significance tests made on taxa occurring in five or more plots; ** = significant at 0.01 level, * = significant at 0.05 level, NS = not significant.

POOR ORIGINAL

1565 267

POOR ORIGINAL

Table 6.2-8

Ground cover occurring in the "vine" portion of the black locust forest on Three Mile Island, 1976.

Species	Common Name	Relative Frequency (percent)	Relative Coverage (percent)	Importance Value
Non-vegetative cover	-	9.32	45.13	54.45
Pilea pumila	clearweed	7.96	11.61	19.57
Lonicera japonica	Japanese honeysuckle	8.14	5.87	14.01
Viola spp.	violet	8.23	3.41	11.64
Polygonum virginianum	Virginia knotweed	6.67	3.21	9.88
Boehmeria cylindrica	false nettle	5.48	4.20	9.68
Grass (unidentified)	grass	5.48	4.04	9.52
Geum canadense	avens	7.50	1.80	9.30
Polygonum scandens	false buckwheat	4.39	3.67	8.06
Impatiens spp.	jewelweed	5.30	1.84	7.14
Eupatorium rugosum	white snakeroot	3.29	2.20	5.49
Solidago spp.	goldenrod	3.11	2.28	5.39
Phytolacca americana	pokeweed	2.29	2.81	5.10
Verbesina alternifolia	wingstem	2.29	2.74	5.03
Polygonum spp.	smartweed	2.83	1.67	4.50
Teucrium canadense	wood sage	2.47	0.74	3.21
Parthenocissus quinquefolia	Virginia creeper	2.83	0.27	3.10
Rubus sp.	blackberry	2.10	0.50	2.60
Rhus radicans	poison ivy	2.10	0.12	2.22
Celastrus scandens	bittersweet	1.19	0.35	1.54
Rumex altissimus	water dock	1.19	0.12	1.31
Urtica dioica	stinging nettle	0.55	0.39	0.94
Commelina communis	dayflower	0.73	0.18	0.91
Vitis sp.	grape	0.55	0.15	0.70
Sicyos angulatus	bur cucumber	0.64	0.05	0.69
Glechoma hederacea	ground ivy	0.46	0.10	0.56
Carex sp.	sedge	0.46	0.06	0.52
Allium vineale	wild garlic	0.46	0.03	0.49
Hackelia virginiana	beggar's lice	0.27	0.15	0.42
Potentilla simplex	cinquefoil	0.37	0.03	0.40
Oxalis sp.	wood sorrel	0.37	0.02	0.39
Acalypha virginica	three-seeded mercury	0.27	0.04	0.31
Dioscorea villosa	wild yam	0.18	0.09	0.27
Lactuca laciniata	coneflower	0.18	0.01	0.19
Scrophularia marilandica	figwort	0.09	0.06	0.15
Aster sp.	aster	0.09	0.02	0.11
Lycopus virginicus	bugleweed	0.09	0.02	0.11
Strophostyles helvola	wild bean	0.09	0.02	0.11

1565 268

Table 6.2-9

Comparison of the dominant ground cover[1] occurring in the "vine" portion of the south woodlot on Three Mile Island, 1973-1976.

Species	Relative Frequency				Relative Coverage				Importance Value				1976 vs 1975		1976 vs 1973	
	1973	1974	1975	1976	1973	1974	1975	1976	1973	1974	1975	1976	t	Significance[2]	t	Significance
Non-vegetative cover	1.2	2.9	9.1	9.3	0.8	2.1	37.7	45.1	2.0	5.0	46.8	54.4	5.115	**	25.800	**
Pilea pumila	9.7	9.9	7.1	8.0	33.5	28.1	12.7	11.6	43.2	28.0	19.8	19.6	-0.909	NS	-6.645	**
Lonicera japonica	6.8	6.8	7.6	8.1	8.4	10.1	5.3	5.9	15.2	16.9	12.9	14.0	1.134	NS	0.135	NS
Viola spp.	5.5	4.8	7.9	8.2	5.2	4.4	2.9	3.4	10.7	9.2	10.6	11.6	2.730	**	0.733	NS
Polygonum virginianum	6.7	5.9	6.3	6.7	5.9	5.1	4.2	3.2	12.6	11.0	10.5	9.9	-2.117	*	-2.404	*
Eschscholzia cylindrica	5.2	6.8	6.4	5.5	5.6	6.1	4.3	4.2	10.8	12.9	10.7	9.7	-1.686	NS	-0.011	NS
Geum canadense	4.3	6.2	5.8	7.5	1.7	2.6	1.9	1.8	6.0	8.8	7.7	9.3	2.536	*	3.419	**
Polygonum scandens	4.7	5.9	5.0	4.4	6.9	9.7	5.1	3.7	11.6	15.6	10.1	8.1	-2.870	**	-1.975	NS
Impatiens spp.	5.2	5.9	7.0	5.3	2.4	6.2	5.3	1.8	7.6	12.1	12.3	7.1	-6.709	**	0.546	NS
Solidago spp.	5.0	4.9	4.1	3.1	5.1	3.6	2.2	2.3	10.1	8.5	6.3	5.4	-1.773	NS	-4.310	**
Phytolacca americana	3.2	3.8	3.0	2.3	3.1	4.9	4.8	2.8	6.3	8.7	7.8	5.1	-2.812	**	-0.156	NS
Polygonum spp.	3.2	1.9	2.7	2.8	2.2	1.3	2.1	1.7	5.4	3.2	4.8	4.5	-1.447	NS	-0.269	NS
Leucrium canadense	4.6	3.1	2.1	2.5	4.1	1.8	0.6	0.7	8.7	4.9	2.7	3.2	0.818	NS	-5.216	**
Parthenocissus quinquefolia	3.4	4.0	1.4	2.8	0.7	1.6	0.2	0.3	4.1	5.6	1.6	3.1	-2.008	*	3.020	**
Rubus sp.	5.5	4.6	2.6	3.1	2.9	2.2	0.6	0.5	8.4	6.8	3.2	2.6	-1.356	NS	-6.190	**
Rhus radicans	4.7	3.8	3.3	2.1	1.5	0.9	0.5	0.1	6.2	4.7	3.8	2.2	-2.481	*	-5.932	**

1 Dominant ground cover is defined in Table 6.2-4.
2 ** = significant at 0.01 level, * = significant at 0.05 level, NS = not significant.

Table 6.2-10

Tree seedlings in the "vine" portion of the black locust forest on Three Mile Island, 1973-1976.

Species	Common Name	Seedlings/Acre		
		1973	1975	1976
Ailanthus altissima	tree-of-heaven	84.7	9.1	58.8
Prunus serotina	black cherry	50.8	27.3	19.6
Acer negundo	box elder	59.3	9.1	9.8
Celtis occidentalis	hackberry	16.9	18.2	9.8
Sassafras albidum	sassafras	84.7	9.1	9.8
Acer saccharinum	silver maple	0.0	9.1	0.0
Betula nigra	river birch	0.0	9.1	0.0

1565 269

POOR ORIGINAL

Table 6.2-11

Ground cover occurring in the "non-vine" portion of the black locust forest on Three Mile Island, 1976.

Species	Common Name	Relative Frequency (percent)	Relative Coverage (percent)	Importance Value
Non-vegetative cover	-	8.04	24.97	33.01
Pilea pumila	clearweed	7.32	15.50	22.82
Grass (unidentified)	grass	7.44	10.63	18.07
Solidago spp.	goldenrod	6.48	7.72	14.20
Boehmeria cylindrica	false nettle	5.64	7.68	13.32
Geum canadense	avens	7.68	4.06	11.74
Viola spp.	violet	6.36	3.00	9.36
Polygonum virginianum	Virginia knotweed	6.24	3.10	9.34
Impatiens spp.	jewelweed	5.64	3.60	9.24
Lonicera japonica	Japanese honeysuckle	4.32	3.46	7.78
Teucrium canadense	wood sage	4.68	2.66	7.34
Phytolacca americana	pokeweed	3.12	3.66	6.78
Rubus spp.	blackberry	3.60	1.33	4.93
Polygonum scandens	false buckwheat	3.12	1.81	4.93
Polygonum spp.	smartweed	2.28	1.47	3.75
Verbesina alternifolia	wingstem	1.20	1.81	3.01
Eupatorium rugosum	white snakeroot	1.56	1.09	2.65
Rhus radicans	poison ivy	2.04	* 0.25	2.29
Carex sp.	sedge	1.80	0.48	2.28
Commelina communis	dayflower	1.56	0.31	1.87
Solanum carolinense	horse nettle	1.20	0.18	1.38
Parthenocissus quinquefolia	Virginia creeper	1.20	0.08	1.28
Hackel'a virginiana	beggar's lice	0.96	0.22	1.18
Potentilla simplex	cinquefoil	1.08	0.07	1.15
Rumex altissimus	water dock	1.09	0.07	1.16
Sicyos angulatus	bur cucumber	0.72	0.19	0.91
Urtica dioica	stinging nettle	0.48	0.28	0.76
Allium vineale	wild garlic	0.60	0.03	0.63
Acalypha virginica	three-seeded mercury	0.48	0.04	0.52
Oxalis sp.	wood sorrel	0.48	0.02	0.50
Verbena urticifolia	blue vervain	0.24	0.09	0.33
Aster ericoides	heath aster	0.24	0.04	0.28
Celastrus scandens	bittersweet	0.12	0.04	0.16
Fragaria virginiana	strawberry	0.12	0.03	0.15
Lycopus virginicus	bugleweed	0.12	0.03	0.15
Vitis sp.	grape	0.12	0.03	0.15
Ambrosia artemisiifolia	ragweed	0.12	0.02	0.14
Rosa sp.	wild rose	0.12	0.01	0.13
Taraxacum officinale	dandelion	0.12	0.01	0.13
Trifolium repens	white clover	0.12	0.01	0.13
Botrychium dissectum	grape fern	0.12	0.00*	0.12

* Indicates less than 0.005 percent relative coverage.

POOR ORIGINAL

1565 270

Table 6.2-12

Comparison of the dominant ground cover[1] occurring in the "non-vine" portion of the south woodlot on Three Mile Island, 1973-1976.

Species	Relative Frequency				Relative Coverage				Importance Value				1976 vs 1975		1976 vs 1973	
	1973	1974	1975	1976	1973	1974	1975	1976	1973	1974	1975	1976	t	Significance[2]	t	Significance
Non-vegetative cover	1.1	1.7	7.7	8.0	1.3	1.9	20.7	25.0	2.4	3.6	28.4	33.0	2.857	**	17.725	**
Pilea pumila	5.2	7.0	7.3	7.3	5.3	11.4	11.4	15.5	10.5	18.4	18.7	22.8	2.633	*	6.663	**
Solidago spp.	8.1	6.0	6.6	6.5	12.3	8.5	8.1	7.7	20.4	14.3	14.7	14.2	-0.121	NS	-0.932	NS
Boehmeria cylindrica	2.1	5.8	6.0	5.6	0.8	4.7	9.1	7.7	2.9	10.5	15.1	13.3	-1.071	NS	6.977	**
Geum canadense	6.3	7.4	6.7	7.7	2.7	6.1	3.4	4.1	9.0	13.5	10.1	11.7	1.904	NS	4.619	**
Viola spp.	7.2	5.1	6.4	6.4	7.0	6.2	4.1	3.0	14.2	11.3	10.5	9.4	-2.090	*	-1.457	NS
Polygonum virginianum	4.1	4.7	5.7	6.2	3.9	4.5	2.9	3.1	8.0	9.2	8.6	9.3	1.055	NS	1.622	NS
Impatiens spp.	4.1	4.0	6.1	5.6	1.6	3.0	4.7	3.6	5.7	7.0	10.8	9.2	-1.307	NS	3.494	**
Lonicera japonica	4.2	3.7	4.4	4.3	6.9	4.6	3.7	3.5	11.1	8.3	8.1	7.8	-0.079	NS	-0.480	NS
Teucrium canadense	8.9	5.4	3.3	4.7	18.1	5.5	1.9	2.7	27.0	10.9	5.2	7.3	1.971	NS	-7.681	**
Phytolacca americana	2.6	2.2	2.9	3.1	1.9	2.4	5.0	3.7	4.5	4.6	7.9	6.8	-0.650	NS	2.488	*
Rubus spp.	6.3	5.1	3.7	3.6	7.1	5.8	2.6	1.1	13.4	10.9	6.3	4.9	-2.865	**	-4.348	**
Polygonum scandens	3.4	5.7	4.9	3.1	0.6	6.5	4.0	1.8	4.0	12.2	8.9	4.9	-3.435	**	2.148	*
Rhus radicans	4.1	3.1	2.2	2.0	1.3	0.4	0.2	0.3	5.4	3.5	2.4	2.3	-0.114	NS	-2.307	*
Parthenocissus quinquefolia	4.4	4.0	1.3	1.2	1.2	1.0	0.1	0.1	5.6	5.0	1.4	1.3	-0.628	NS	-4.315	**
Potentilla simplex	4.2	4.7	2.7	1.1	0.6	0.9	0.3	0.1	4.8	5.6	3.0	1.2	-3.576	**	-3.968	**

1 Dominant ground cover is defined in Table 6.2-4.
2 ** = significant at 0.01 level, * = significant at 0.05 level, NS = Not significant.

POOR ORIGINAL

1565 271

Table 6.2-13

Tree seedlings in the "non-vine" portion of the black locust forest on Three Mile Island, 1973, 1975, and 1976.

Species	Common Name	Seedlings/Acre		
		1973	1975	1976
Prunus serotina	black cherry	14.1	29.0	29.9
Sassafras albidum	sassafras	0.0	0.0	29.9
Robinia pseudoacacia	black locust	0.0	29.0	14.9
Ailanthus altissima	tree-of-heaven	197.2	14.5	14.9
Betula nigra	river birch	0.0	14.5	14.9

POOR ORIGINAL

Ground cover occurring in the south field on Three Mile Island, 1976.

Species	Common Name	Relative Frequency (percent)	Relative Coverage (percent)	Importance Value
Aster pricoides	heath aster	13.[illegible]	36.06	49.34
Grass (unidentified)	grass	13.27	35.48	48.65
Solidago spp.	goldenrod	13.79	14.51	27.79
Non-vegetative cover	-	7.83	2.95	10.78
Rubus spp.	blackberry	5.55	1.59	7.14
Melilotus alba	white sweet clover	2.50	1.96	4.46
Cirsium arvense	Canada thistle	3.92	0.33	4.25
Setaria faberii	nodding foxtail	1.85	1.48	3.33
Hypericum punctatum	St. John's wort	3.24	0.15	3.31
Lonicera japonica	Japanese honeysuckle	1.63	1.37	3.00
Taraxacum officinale	dandelion	2.63	0.11	2.94
Oenothera biennis	evening primrose	2.39	0.19	2.58
Geum canadense	avens	1.96	0.19	2.15
Rumex altissimus	water dock	1.65	0.18	2.03
Verbesina alternifolia	wingstem	1.41	0.48	1.89
Acalypha virginica	three-seeded mercury	1.74	0.04	1.78
Potentilla simplex	cinquefoil	1.52	0.21	1.73
Conium maculatum	poison hemlock	1.20	0.21	1.41
Phytolacca americana	pokeweed	0.45	0.60	1.20
Solanum carolinense	horse nettle	1.09	0.05	1.14
Oxalis sp.	wood sorrel	1.09	0.03	1.12
Rhus radicans	poison ivy	0.98	0.04	1.02
Polygonum spp.	smartweed	0.87	0.08	0.95
Ambrosia artemisiifolia	ragweed	0.76	0.15	0.9
Boehmeria cylindrica	false nettle	0.76	0.14	0.9
Eupatorium perfoliatum	boneset	0.87	0.03	0.9
Lycopus virginicus	bugleweed	0.87	0.03	0.9
Polygonum scandens	false buckwheat	0.76	0.14	0.9
Viola sp.	violet	0.76	0.12	0.8
Plantago lanceolata	English plantain	0.44	0.36	0.80
Allium vineale	wild garlic	0.65	0.08	0.73
Teucrium canadense	wood sage	0.65	0.05	0.70
Impatiens sp.	jewelweed	0.65	0.03	0.68
Juncus sp.	rush	0.54	0.13	0.67
Vitis sp.	grape	0.54	0.02	0.56
Stellaria media	chickweed	0.54	0.01	0.55
Daucus carota	Queen Anne's lace	0.44	0.01	0.45
Lobelia inflata	Indian tobacco	0.44	0.01	0.45
Apocynum medium	dogbane	0.33	0.04	0.37
Rumex acetosella	sheep sorrel	0.33	0.02	0.35
Epilobium coloratum	willow herb	0.33	0.01	0.34
Bidens frondosa	beggar-ticks	0.22	0.05	0.27
Verbena urticifolia	white vervain	0.22	0.03	0.25
Mustard (unidentified)	mustard	0.22	0.03	0.25
Conyza canadensis	horseweed	0.22	0.01	0.23
Fragaria virginiana	strawberry	0.22	0.01	0.23
Potentilla recta	cinquefoil	0.22	0.01	0.23
Trifolium sp.	white clover	0.22	0.01	0.23
Galium sp.	bedstraw	0.22	0.01	0.23
Hackelia virginiana	beggar's lice	0.11	0.02	0.13
Onoclea sensibilis	sensitive fern	0.11	0.02	0.13
Chenopodium album	lamb's quarters	0.11	0.02	0.13
Lysimachia ciliaris	loosestrife	0.11	0.01	0.12
Mollugo verticellata	carpetweed	0.11	0.01	0.12
Physalis longifolia	ground cherry	0.11	0.01	0.12
Pilea pumila	clearweed	0.11	0.01	0.12
Rubus strigosus	red raspberry	0.11	0.01	0.12
Anagallis arvensis	scarlet pimpernel	0.11	0.01	0.12
Desmodium viridiflorum	tick trefoil	0.11	0.00*	0.11
Eupatorium rugosum	white snakeroot	0.11	0.00	0.11
Plantago major	plantain	0.11	0.00	0.11
Polygala sanguinea	milkwort	0.11	0.00	0.11
Scirpus atrovirens	bulrush	0.11	0.00	0.11
Scrophularia marilandica	figwort	0.11	0.00	0.11
Trifolium pratense	red clover	0.11	0.00	0.11
Urtica dioica	stinging nettle	0.11	0.00	0.11
Xanthium strumarium	cocklebur	0.11	0.00	0.11

* Indicates less than 0.005 percent relative coverage.

1565 272

Table 6.2-15

Comparison of dominant ground cover[1] occurring in the south field on Three Mile Island, 1973-1976.

Species	Relative Frequency				Relative Coverage				Importance Value				1976 vs 1975		1976 vs 1973	
	1973	1974	1975	1976	1973	1974	1975	1976	1973	1974	1975	1976	t	Significance[2]	t	Significance
Aster ericoides	15.7	15.9	16.6	13.3	29.9	45.6	45.3	36.1	43.6	61.5	61.9	49.3	-1.625	NS	1.992	*
Solidago spp.	14.1	14.3	16.0	13.3	16.1	20.2	23.7	14.5	30.2	34.5	39.7	27.8	-3.364	**	-0.340	NS
Non-vegetative cover	1.3	1.7	12.6	7.8	0.3	0.5	4.4	3.0	1.6	2.2	17.0	10.8	-2.043	*	7.914	**
Rubus spp.	3.2	5.4	5.0	5.6	1.0	3.1	1.0	1.6	4.2	8.5	6.0	7.1	2.606	*	2.262	*
Cirsium arvense	5.3	6.4	4.9	3.9	2.6	2.9	1.5	0.3	7.9	9.3	6.4	4.2	-2.644	*	-4.117	**
Setaria faberii	13.1	7.6	1.8	1.8	25.7	5.9	0.8	1.5	38.8	13.5	2.6	3.3	0.962	NS	-13.866	**
Solanum carolinense	10.0	8.0	0.7	1.1	3.8	1.3	0.1	0.1	13.8	9.3	0.8	1.1	0.570	NS	-10.838	**
Ambrosia artemisiifolia	9.4	0.5	0.7	0.8	7.8	2.5	0.1	0.2	17.2	6.0	0.8	0.9	1.595	NS	-9.189	**
Bidens frondosa	5.8	3.0	0.5	0.2	5.6	3.2	0.1	0.1	11.4	6.2	0.6	0.3	1.296	NS	-6.423	**
Conyza canadensis[3]	4.2	4.8	-	0.2	1.0	7.9	-	0.0	5.2	12.7	-	0.2	-		-	

1 Dominant ground cover is defined in Table 6.2-4.
2 ** = significant at 0.01 level, * = significant at 0.05 level, NS = not significant.
3 Conyza canadensis was not reported in 1975, and frequency was too low to test in 1976.

POOR ORIGINAL

1565 273

Table 6.2-16

Tree seedlings in the south field on Three Mile Island, 1973-1976.

Species	Common Name	Seedlings/Acre		
		1973	1975	1976
Betula nigra	river birch	296.3	296.9	87.3
Acer saccharinum	silver maple	7.4	23.4	39.7
Platanus occidentalis	sycamore	0.0	7.8	7.9
Robinia pseudoacacia	black locust	0.0	7.8	0.0
Viburnum prunifolium	black haw	0.0	7.8	0.0
Fraxinus sp.	ash	37.0	0.0	0.0
Prunus serotina	black cherry	7.4	0.0	0.0

Table 6.2-17

Ground cover occurring in the field near the south ponds on Three Mile Island, 1976.

Species	Common Name	Relative Frequency (percent)	Relative Coverage (percent)	Importance Value
Aster ericoides	heath aster	9.76	53.81	63.57
Grass (unidentified)	grass	9.53	11.32	20.85
Oenothera biennis	evening primrose	8.87	8.04	16.91
Non-vegetative cover	-	7.98	7.00	14.98
Solidago spp.	goldenrod	8.65	5.61	14.26
Ambrosia artemisiifolia	ragweed	6.87	3.33	10.20
Rumex acetosella	sheep sorrel	7.10	1.82	8.92
Cirsium arvense	Canada thistle	7.32	1.50	8.82
Polygonum spp.	smartweed	3.55	1.21	4.76
Taraxacum officinale	dandelion	3.77	0.26	4.03
Setaria faberii	nodding foxtail	1.57	2.37	3.92
Melilotus alba	white sweet clover	2.88	0.70	3.58
Rubus spp.	blackberry	2.44	0.61	3.05
Oxalis sp.	wood sorrel	2.44	0.14	2.58
Solanum carolinense	horse nettle	1.77	0.10	1.87
Potentilla simplex	cinquefoil	0.89	0.80	1.69
Lysimachia ciliata	fringed loosestrife	1.33	0.14	1.47
Geum canadense	avens	1.33	0.11	1.44
Hypericum punctatum	St. John's wort	1.33	0.11	1.44
Daucus carota	Queen Anne's lace	1.11	0.27	1.38
Trifolium sp.	white clover	1.11	0.10	1.21
Rumex altissimus	water dock	1.11	0.09	1.20
Stellaria media	chickweed	1.11	0.07	1.18
Fragaria virginiana	strawberry	1.11	0.04	1.15
Carex sp.	sedge	0.67	0.10	0.77
Viola sp.	violet	0.67	0.02	0.69
Desmodium sp.	tick-trefoil	0.44	0.07	0.51
Asclepias incarnata	swamp milkweed	0.44	0.04	0.48
Conium maculatum	poison hemlock	0.44	0.04	0.48
Eupatorium perfoliatum	boneset	0.44	0.03	0.47
Lonicera japonica	Japanese honeysuckle	0.22	0.05	0.27
[illegible]	horseweed	0.22	0.04	0.26
Juncus sp.	rush	0.22	0.02	0.24
Verbesina alternifolia	wingstem	0.22	0.02	0.24
Cassia fasciculata	partridge pea	0.22	0.01	0.23
Polygonum scandens	false buckwheat	0.22	0.01	0.23
Physalis longifolia	ground cherry	0.22	0.01	0.23
Teucrium canadense	wood sage	0.22	0.01	0.23
Mustard (unidentified)	mustard	0.22	0.01	0.23

POOR ORIGINAL

1565 274

Table 6.2-18

Comparison of dominant ground cover[1] occurring in the field near the south ponds on Three Mile Island, 1973-1976.

Species	Relative Frequency				Relative Coverage				Importance Value				1976 vs 1975		1976 vs 1973	
	1973	1974	1975	1976	1973	1974	1975	1976	1973	1974	1975	1976	t	Significance[2]	t	Significance
Aster ericoides	0.9	9.9	9.3	9.8	0.1	16.3	37.6	53.8	1.0	26.2	46.9	63.6	6.464	**	19.405	**
Oenothera biennis	0.9	2.7	8.6	8.9	0.4	0.4	11.9	8.0	1.3	3.1	20.7	16.9	-1.229	NS	11.167	**
Non-vegetative cover	0.2	0.2	7.9	8.0	0.1	0.2	8.7	7.0	0.3	0.5	16.6	15.0	0.510	NS	9.140	**
Solidago spp.	0.9	4.5	6.4	8.7	0.4	2.1	4.4	5.6	1.3	6.6	10.8	14.3	1.990	*	-10.463	**
Ambrosia artemisiifolia	10.3	13.7	1.6	6.9	12.4	11.7	0.7	3.3	22.7	25.4	2.3	10.2	6.234	**	-1.679	
Rumex acetosella[3]	-	0.9	7.5	7.1	-	0.2	0.9	1.8	-	1.1	15.4	8.9	-3.530	**	-	
Cirsium arvense	6.6	10.5	8.4	7.3	5.7	7.2	7.3	1.5	12.3	17.7	15.7	8.8	-4.074	**	-3.186	**
Polygonum spp.	8.7	0.6	1.1	3.6	3.2	0.3	0.1	1.2	11.9	0.9	1.2	4.8	4.172	**	-3.701	**
Setaria faberii	11.6	2.4	5.0	1.6	23.9	0.4	1.4	2.4	35.5	2.8	6.4	3.9	-1.833	NS	-10.981	**
Solanum carolinense	11.9	14.3	3.8	1.8	12.9	9.8	0.5	0.1	24.8	24.1	4.3	1.9	-1.943	*	-34.315	**
Conyza canadensis	2.3	14.9	7.2	0.2	0.3	44.8	8.9	0.0	2.6	59.7	16.1	0.3	-7.818	**	-3.073	**
Bidens sp.[4]	11.9	4.8	-	-	28.9	3.2	-	-	40.8	8.0	-	-	-		-	
Xanthium strumarium[5]	5.3	0.9	0.5	-	1.7	0.1	0.1	-	7.0	1.0	0.6	-	-		-	

1 Dominant ground cover is defined in Table 6.2-4.
2 ** = significant at 0 1 level, * = significant at 0.05 level, NS = not significant.
3 Rumex acetosella not eported in 1973
4 Bidens sp. not report d in 1975 or 1976.
5 Xanthium strumarium n t reported in 1976.

POOR ORIGINAL

Table 6.2-19

Tree seedlings in the field near the south ponds on Three Mile Island, 1976.

Species	Common Name	Seedlings/Acre		
		1973	1975	1976
Acer saccharinum	silver maple	0.0	0.0	68.2
Fraxinus sp.	ash	0.0	0.0	22.7

1565 275

Table 6.2-20

Ground cover occurring in the north field on Three Mile Island, 1976.

Species	Common Name	Relative Frequency (percent)	Relative Coverage (percent)	Importance Value
Aster ericoides	heath aster	8.76	38.36	47.12
Grass (unidentified)	grass	10.24	22.14	32.38
Solidago spp.	goldenrod	9.61	8.35	17.96
Non-vegetative cover	-	7.50	8.13	15.63
Rubus spp.	blackberry	5.70	6.32	12.02
Lonicera japonica	Japanese honeysuckle	1.80	2.98	4.78
Acalypha virginica	three-seeded mercury	3.70	0.31	4.01
Polygonum scandens	false buckwheat	2.64	0.88	3.52
Desmodium sp.	tick trefoil	2.53	0.94	3.47
Oenothera biennis	evening primrose	2.96	0.42	3.38
Vitis sp.	grape	1.80	1.01	2.81
Eupatorium perfoliatum	boneset	2.32	0.41	2.73
Solanum carolinense	horse nettle	2.43	0.21	2.64
Impatiens sp.	jewelweed	1.80	0.70	2.50
Eupatorium rugosum	white snakeroot	1.69	0.73	2.42
Setaria [illegible]berii	nodding foxtail	1.69	0.65	2.34
Rumex al[illegible]	water dock	2.11	0.17	2.28
Juncus spp.	rush	1.48	0.65	2.13
Verbesina alternifolia	wingstem	1.69	0.44	2.13
Melilotus alba	white sweet clover	0.84	1.22	2.06
Ambrosia artemisiifolia	ragweed	1.37	0.37	1.74
Cassia fasciculata	partridge pea	1.27	0.34	1.61
Bidens spp.	bur marigold	1.16	0.36	1.52
Fragaria virginiana	strawberry	1.27	0.19	1.46
Oxalis sp.	wood sorrel	1.27	0.10	1.37
Viola sp.	violet	1.06	0.15	1.21
Pilea pumila	clearweed	0.95	0.20	1.15
Lysimachia vulgaris	loosestrife	0.84	0.17	1.01
Apocynum medium	dogbane	0.84	0.06	0.90
Boehmeria cylindrica	false nettle	0.63	0.26	0.89
Commelina communis	dayflower	0.74	0.13	0.87
Polygonum spp.	smartweed	0.74	0.09	0.83
Lycopus americanus	water horehound	0.74	0.08	0.82
Hypericum punctatum	St. John's wort	0.74	0.06	0.80
Cirsium arvense	Canada thistle	0.74	0.04	0.78
Teucrium canadense	wood sage	0.74	0.04	0.78
Urtica dioica	stinging nettle	0.42	0.30	0.72
Gerardia tenuifolia	gerardia	0.53	0.10	0.63
Rhus radicans	poison ivy	0.53	0.09	0.62
Euphorbia maculata	spurge	0.53	0.08	0.61
Mimulus ringens	monkey flower	0.42	0.16	0.58
Parthenocissus quinquefolia	Virginia creeper	0.53	0.05	0.58
Typha latifolia	cat-tail	0.42	0.15	0.57
Mustard (unidentified)	mustard	0.53	0.04	0.57
Rumex acetosella	sheep sorrel	0.42	0.10	0.52
Conium maculatum	poison hemlock	0.42	0.05	0.47
Daucus carota	Queen Anne's lace	0.42	0.05	0.47
Lythrum salicaria	purple loosestrife	0.32	0.15	0.47
Geum canadense	avens	0.42	0.03	0.45
Potentilla recta	cinquefoil	0.42	0.03	0.45

POOR ORIGINAL

1565 276

Table 6.2-29 continued.

Species	Common Name	Relative Frequency (percent)	Relative Coverage (percent)	Importance Value
Verbena urticifolia	white vervain	0.32	0.11	0.43
Aster novae-angliae	New England aster	0.32	0.10	0.42
Eleocharis sp.	spike-rush	0.21	0.15	0.36
Anagallis arvensis	scarlet pimpernel	0.32	0.03	0.35
Hieracium sp.	hawkweed	0.32	0.03	0.35
Strophostyles helvola	wild bean	0.32	0.02	0.34
Penthorum sedoides	ditch stonecrop	0.21	0.05	0.26
Clematis virginiana	virgin's bower	0.21	0.04	0.25
Allium vineale	wild garlic	0.21	0.02	0.23
Aster sp.	aster	0.21	0.02	0.23
Rosa sp.	wild rose	0.11	0.12	0.23
Asclepias incarnata	swamp milkweed	0.21	0.01	0.22
Crotalaria sagittalis	rattlebox	0.21	0.01	0.22
Hypericum virginicum	marsh St. John's wort	0.21	0.01	0.22
Taraxacum officinale	dandelion	0.21	0.00	0.21
Pycnanthemum sp.	mountain mint	0.11	0.06	0.17
Carex sp.	sedge	0.11	0.05	0.16
Glechoma hederacea	ground ivy	0.11	0.05	0.16
Cyperus sp.	galingale	0.11	0.03	0.14
Helianthus decapetalus	sunflower	0.11	0.03	0.14
rosette (unidentified)	unidentified rosette	0.11	0.02	0.13
Celastrus scandens	bittersweet	0.11	0.01	0.12
Eupatorium coelestinum	mistflower	0.11	0.01	0.12
Eupatorium serotinum	throughwort	0.11	0.01	0.12
Onoclea sensibilis	sensitive fern	0.11	0.01	0.12
Physalis longifolia	ground cherry	0.11	0.01	0.12
Trifolium sp.	white clover	0.11	0.01	0.12
Conyza canadensis	horseweed	0.11	0.00*	0.11
Plantago major	plantain	0.11	0.00	0.11
Potentilla simplex	cinquefoil	0.11	0.00	0.11
Stellaria media	chickweed	0.11	0.00	0.11

* Indicates less than 0.005 percent telative coverage.

POOR ORIGINAL

1565 277

Table 6.2-21

Comparison of the dominant ground cover[1] occurring in the north field on Three Mile Island, 1973-1976.

Species	Relative Frequency				Relative Coverage				Importance Value				1976 vs 1975		1976 vs 1973	
	1973	1974	1975	1976	1973	1974	1975	1976	1973	1974	1975	1976	t	Significance[2]	t	Significance
Aster ericoides	12.4	13.1	8.4	8.8	14.2	38.9	37.1	38.4	26.6	52.0	45.5	47.1	-0.047	NS	2.012	*
Solidago spp.	7.5	7.2	8.5	9.6	3.3	5.0	5.8	8.4	11.3	12.2	14.3	18.0	3.973	**	5.077	**
Non-vegetative cover	0.6	0.2	5.4	7.5	0.2	0.0	5.4	8.1	0.8	0.2	10.8	15.6	1.972	NS	9.324	**
Rubus spp.	6.6	8.6	5.7	5.7	7.1	18.8	11.3	6.3	13.7	27.4	17.0	12.0	-4.196	**	-0.972	NS
Pennedlum sp.	5.2	5.9	3.6	2.5	1.3	2.4	2.6	0.9	8.5	8.3	6.2	3.5	-2.515	*	-3.609	**
Solanum carolinense	5.1	4.5	2.4	2.4	1.2	0.6	0.2	0.2	6.5	5.1	2.6	2.6	-0.257	NS	-5.022	**
Setaria lutescens	13.4	9.7	4.0	1.7	28.8	15.4	0.9	0.6	42.2	25.1	4.9	2.3	-2.071	*	-5.090	**
Ambrosia artemisiifolia	13.9	0.6	2.3	1.4	24.7	4.3	0.3	0.4	38.6	10.9	2.6	1.7	-0.495	NS	-22.616	**
Hypericum punctatum	1.7	5.4	4.8	0.7	0.2	1.6	1.4	0.1	1.9	7.0	6.2	0.8	-6.185	**	-1.722	NS
Conyza canadensis[3]	9.2	2.9	-	0.1	7.4	1.4	-	0.0	16.6	4.3	-	0.1	-		-	

1 Dominant ground cover is defined in Table 6.2-4.
2 ** = significant at 0.01 level, * = significant at 0.05 level, NS = not significant.
3 Conyza canadensis was not reported in 1975, and frequency was too low to test in 1976.

POOR ORIGINAL

1565 278

Table 6.2-22

Tree seedlings in the north field on Three Mile Island, 1973-1976.

Species	Common Name	Seedlings/Acre		
		1973	1975	1976
Morus rubra	red mulberry	0.0	0.0	9.9
Prunus serotina	black cherry	9.9	0.0	9.9
Robinia pseudoacacia	black locust	0.0	0.0	9.9
Ulmus americana	elm	0.0	0.0	9.9
Platanus occidentalis	sycamore	108.3	69.3	0.0
Acer rubrum	red maple	0.0	39.6	0.0
Acer saccharinum	silver maple	19.8	29.7	0.0
Betula nigra	river birch	0.0	9.9	0.0
Salix sp.	willow	0.0	9.9	0.0
Ailanthus altissima	tree-of-heaven	9.9	0.0	0.0
Fraxinus sp.	ash	9.9	0.0	0.0
Liriodendron tulipifera	tulip tree	9.9	0.0	0.0

POOR ORIGINAL

Table 6.2-23

Ground cover occurring in the field near the 500 kv substation, 1976.

Species	Common Name	Relative Frequency (percent)	Relative Coverage (percent)	Importance Value
Aster ericoides	heath aster	9.69	37.81	[illegible]
Solidago spp.	goldenrod	9.66	27.02	[illegible]
Coronilla varia	crown vetch	3.15	11.00	[illegible]
Cirsium arvense	Canada thistle	7.42	3.20	[illegible]
Daucus carota	Queen Anne's lace	6.97	1.14	[illegible]
Lonicera japonica	Japanese honeysuckle	2.47	5.54	[illegible]
Grass	grass	5.39	2.10	[illegible]
Phleum pratense	timothy	3.82	3.27	[illegible]
Plantago major	common plantain	5.39	0.35	[illegible]
Non-vegetative cover	-	4.27	1.05	[illegible]
Taraxacum officinale	dandelion	4.94	0.36	[illegible]
Trifolium pratense	red clover	4.27	0.90	[illegible]
Apocynum medium	dogbane	4.04	0.93	[illegible]
Glechoma hederacea	ground ivy	2.02	1.66	[illegible]
Rhus radicans	poison ivy	2.92	0.38	[illegible]
Rumex sp.	dock	2.25	0.23	[illegible]
Plantago lanceolata	English plantain	2.25	0.20	[illegible]
Geum canadense	avens	1.80	0.12	[illegible]
Polygonum pensylvanicum	smartweed	1.35	0.51	[illegible]
Solanum carolinense	horse nettle	1.57	0.21	[illegible]
Rubus spp.	blackberry	1.12	0.57	[illegible]
Polygonum scandens	false buckwheat	1.57	0.09	[illegible]
Prunella vulgaris	self-heal	1.35	1.11	[illegible]
Vitis sp.	grape	1.12	0.17	[illegible]
Physalis longifolia	ground cherry	1.12	0.11	[illegible]
Dactylis glomerata	orchard grass	0.67	0.51	[illegible]
Mustard (unidentified)	mustard	1.12	0.05	[illegible]
Cirsium vulgare	bull thistle	0.90	0.05	[illegible]
Lycopus virginicus	bugleweed	0.67	0.07	[illegible]
Oenothera heimis	evening primrose	0.67	0.06	[illegible]
Ambrosia trifida	giant ragweed	0.67	0.05	[illegible]
Ambrosia artemisiifolia	ragweed	0.67	0.03	[illegible]
Achillea millefolium	yarrow	0.45	0.03	[illegible]
Allium vineale	wild garlic	0.45	0.02	[illegible]
Oxalis sp.	wood sorrel	0.45	0.02	[illegible]
Agrimonia gryposepala	agrimony	0.22	0.05	[illegible]
Hieracium sp.	hawkweed	0.22	0.01	[illegible]
Parthenocissus quinquefolia	Virginia creeper	0.22	0.01	[illegible]
Viola sp.	violet	0.22	0.01	[illegible]
Rumex acetosella	sheep sorrel	0.22	0.00*	[illegible]

* Indicates less than 0.005 percent relative coverage.

1565 279

Table 6.2-24

Comparison of the dominant ground cover[1] occurring in the field near the 500 kv substation on Route 441[2], 1974-1976.

Species	Relative Frequency			Relative Coverage			Importance Value			1976 vs 1975		1976 vs 1974	
	1974	1975	1976	1974	1975	1976	1974	1975	1976	t	Signif'sance[3]	t	Significance
Aster ericoides	12.4	9.2	9.9	44.9	48.3	27.8	57.3	57.5	47.7	0.235	NS	-2.555	*
Solidago spp.	7.7	8.7	9.7	2.5	10.4	27.0	10.2	19.1	36.7	2.102	*	7.448	**
Coronilla varia	0.5	4.1	3.2	0.2	16.1	11.0	0.7	20.2	14.2	-0.621	NS	3.589	**
Daucus carota	6.1	6.2	7.4	2.6	2.9	3.2	8.7	9.1	10.6	1.719	NS	1.134	NS
Elaeum pratense	2.8	6.0	7.0	1.5	1.6	1.1	4.3	7.6	8.1	0.206	NS	1.068	NS
Plantago major	2.2	6.7	3.8	1.6	4.3	3.3	3.8	11.0	7.1	-1.618	NS	1.822	NS
Taraxacum officinale	10.7	6.0	5.4	10.0	1.2	0.4	20.7	7.2	5.7	-2.292	*	-9.261	**
Trifolium pratense	7.4	4.8	4.9	2.1	1.0	0.4	9.5	5.8	5.3	-1.597	NS	-4.564	**
Apocynum cedron	12.7	3.2	4.3	23.3	0.4	0.9	36.0	3.6	5.2	1.451	NS	-16.150	**
Convolvulus sepium[4]	1.9	1.7	4.0	0.5	1.2	0.9	2.4	4.9	5.0	0.273	NS	1.719	NS
	3.0	4.4	-	0.4	0.4	-	3.4	4.8	-	-		-	

1 Dominant ground cover is defined in Table 6.2-4.
2 This field was not sampled in 1973.
3 ** = significant at 0.01 level, * = significant at 0.05 level, NS = not significant.
4 Convolvulus sepium not reported in 1976.

Table 6.2-25

Tree seedlings in the field near the 500 kv substation, 1974-1976.

Species	Common Name	Seedlings/Acre		
		1974	1975	1976
Pinus strobus	white pine	217.4	260.9	65.2
Acer rubrum	red maple	0.0	0.0	21.7
Acer negundo	box elder	2.2	0.0	0.0
Acer saccharinum	silver maple	2.2	0.0	0.0

1565 280

POOR ORIGINAL